

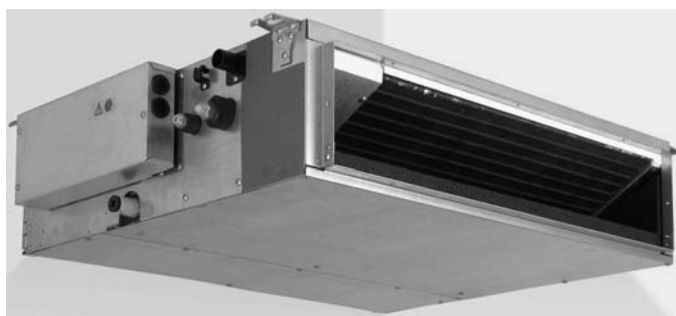


# Service Manual

## DLF DC Inverter Series

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Indoor Units	Outdoor Units
DLF 25 DCI	ONG3-25 DCI
DLF 35 DCI	ONG3-35 DCI
DLF 50 DCI	DCI 50
DLF 60 DCI	DCI 60
DLF 72 DCI	DCI 72Z



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**REFRIGERANT**

**R410A**

**HEAT PUMP**

## LIST OF EFFECTIVE PAGES

**Note:** Changes in the pages are indicated by a "Revision#" in the footer of each effected page (when none indicates no changes in the relevant page). All pages in the following list represent effected/ non effected pages divided by chapters.

Dates of issue for original and changed pages are:

Original ..... 0 ..... November 2007

Total number of pages in this publication is 145 consisting of the following:

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\* Due to constant improvements please note that the data on this service manual can be modified with out notice.

\*\* Photos are not contractual.

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## 1. INTRODUCTION

### 1.1 General

The new **DLF DC INVERTER** concealed split unit range comprises the RC (heat pump) models as follow:

- **DLF 25**
- **DLF 35**
- **DLF 50**
- **DLF 60**
- **DLF 72**

#### Remote control compatibility

The DLF unit is compatible with remote controls RC3, RC4, RCW1, RCW2, and RC7.

Unlike standard units (fix RPM) that are selected according to their nominal capacity to overcome the maximum required load; DC Inverter units can be selected to a smaller nominal capacity range unit.

It made possible due to the ability of inverters to reach a much higher capacity level (indicated as Maximum Capacity) which is around 115-130% of the nominal capacity.

### 1.2 Main Features

High level DC inverter system combined with concealed indoor units.

The system consists of high technology DC Brushless compressor, outdoor and indoor fan motors.

The system adopts new ODP free refrigerant R410A and other environmental regulations such as RoHS, WEEE, etc.

We believe this is the most suitable solution for residential and light commercial air conditioning.

The indoor with only 200 mm height and together with the integrated water pump allows best fit into very low ceiling space.

The units' unique feature is the option of install the unit in horizontal or vertical position without any additional work.

The unit low noise level (up to 25 DBA) fits perfectly for application as hotels, bed room and small offices.

The DLF series benefits from the most advanced technological innovations, namely:

- ✓ Variable cooling and heating capacity from 30% to 115% (of rated capacity)
- ✓ High COP
- ✓ Low noise levels in both indoors and outdoors
- ✓ Extreme low silhouette, only 200mm.
- ✓ Pre-charged system up to 30m
- ✓ Tubing up to 50m length and 30m height difference
- ✓ Networking connectivity
- ✓ Dry contact output – Alarm
- ✓ Ready for base heater and crank case heater installation including software support
- ✓ HMI Display consists of 7-segments shows system diagnostics and setup (in some models only)
- ✓ Monitoring software (PC port for high level service)
- ✓ Operating range cooling: From -10°C to 46°C outdoors
- ✓ Operating range heating: From -15°C to 24°C outdoors

### 1.3 Indoor Unit

The indoor unit can fit easily to many types of residential and commercial applications.

It includes:

- Water-pump drainage build-in.
- Emergency Water-float to prevent over flow.
- Horizontal/ Vertical installation build in.
- 2 options of return air location, on back of the unit or below the unit.
- DC BL motor with maximum fan speed flexibility.
- High technology plastic fan and fan housing.
- Advanced electronic control box assembly with 1-meter cable to allow installation at a more accessible area.

### 1.4 Filtration

The air filter can be located in the back side or in the bottom of the unit for easy access.

### 1.5 Control

The microprocessor indoor controller, and an infrared remote control, supplied as standard, provides complete operating function and programming. For further details, please refer to the Operation Manual, Appendix A.

### 1.6 Outdoor Unit

The outdoor units can be installed as floor or wall mounted units by using a wall-supporting bracket. The metal sheets are protected by anti-corrosion paintwork allowing long life resistance. All outdoor units are pre-charged. For further information, please refer to the Product Data Sheet, Chapter 2.

It includes:

- Compressor mounted in a soundproofed compartment :

**Rotary** – for DLF 25-35

**Scroll** – for DLF 50-60-72

- Improved 3-blades axial fans for noise reduction.
- Outdoor coil with hydrophilic fins for RC units optimised for operation with R 410A refrigerant.
- Fan grill air outlet.
- Service valves" flare" type connection.
- Interconnecting wiring terminal block.

### 1.7 Tubing Connections

Flare type-interconnecting tubing to be produced on site.

For further details, please refer to the Installation Manual, Chapter 9.

## 1.8 Accessories

### RCW Wall Mounted Remote Control

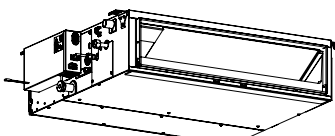
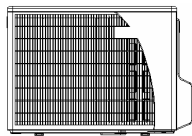
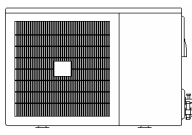
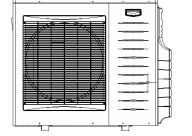
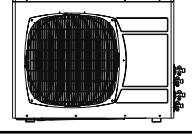
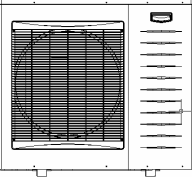
The RCW remote control is mounted on the wall, and controls the unit either as an infrared remote control or as a wired controller. The wired controller can control up to 10 Indoor units with the same program settings and adjustments.

For further details, please refer to the Technical Service Manual.

## 1.9 Inbox Documentation

Each unit includes its own installation and operation manuals.

## 1.10 Matching Table

OUTDOOR UNITS			INDOOR UNITS				
							
MODEL		RE-FRIGER.	DLF 25	DLF 35	DLF 50	DLF 60	DLF 72
	DCI 25 (ONG3)	R410A	✓				
	DCI 35 (ONG3)	R410A		✓			
	DCI 50 (ONG3)	R410A			✓		
	DCI 60 (GC24)	R410A				✓	
	DCI 72Z (GC30)	R410A					✓
	DUO DCI	R410A	✓	✓			
	TRIO DCI	R410A	✓	✓	✓		
	QUATTRO DCI	R410A	✓	✓	✓		

## 2. PRODUCT DATA SHEET

### 2.1 DLF 25 DCI

Model Indoor Unit				DLF 25 DCI		
Model Outdoor Unit				ONG3-25 DCI		
Installation method of Pipe				DUCTED		
Characteristics			Units	Cooling	Heating	
Capacity (1)			Btu/hr	8500 (4780-12280)	11600 (5120-17060)	
			kW	2.5 (1.40-3.60)	3.4 (1.50-5.0)	
Power input (1)			kW	0.625	0.87	
EER (Cooling) or COP (Heating) (1)			W/W	4.0	3.9	
Energy efficiency class				A	A	
Power supply			V/Ph/Hz	220-240/1/50		
Rated current			A	2.7	3.6	
Starting current			A	10.5		
Circuit breaker rating			A	16		
INDOOR	Fan type & quantity			Centrifugal & 2		
	Fan speeds		H/ M/ L	RPM	920/810/740	
	Air flow (2)		H/ M/ L	m³/hr	620/560/490	
	External static pressure		Min-Max	Pa	0-30	
	Sound power level (3)		H/ M/ L	dB(A)	50/47/44	
	Sound pressure level (4)		H/ M/ L	dB(A)	29/26/23	
	Moisture removal		L/hr	0.5		
	Condensate drain tube I.D		mm	19		
	Dimensions		WxHxD	mm	750x630x200	
	Weight		kg	20		
	Package dimensions		WxHxD	mm	885x695x226	
	Packaged weight		kg	23		
	Units per pallet		Units	14		
	Stacking height		Units	7		
OUTDOOR	Refrigerant control			Electronic Expansion Valve		
	Compressor type, model			DC Inverter single rotary		
	Fan type & quantity			Axial & 1		
	Air flow		H / L	m³/hr	1780	
	Sound power level		H / L	dB(A)	60	
	Sound pressure level (4)		H / L	dB(A)	50	
	Dimensions		WxHxD	mm	795x610x290	
	Weight		kg	38		
	Package dimensions		WxHxD	mm	945x655x395	
	Packaged weight		kg	41		
	Units per pallet		Units	9		
	Stacking height		Units	3		
	Refrigerant type			R410A		
	Refrigerant charge (standard connecting tubing length)		kg	1.1		
	Additional charge per 1 meter		g/m	No need		
	Connections between units	Liquid line		In.	1/4"	
		Suction line		In.	3/8"	
		Max. tubing length		m.	20	
		Max. height difference		m.	15	
Operation control type				I.R Remote control		
Heating elements			kW			
Others						

(1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).

(2) Airflow without external static pressure.

(3) Sound power in ducted units is measured at air discharge.

(4) Sound pressure level measured at 1-meter distance from unit.

## 2.2 DLF 35 DCI

Model Indoor Unit				DLF 35 DCI	
Model Outdoor Unit				ONG3-35 DCI	
Installation method of Pipe				DUCTED	
Characteristics			Units	Cooling	Heating
Capacity (1)			Btu/hr	11940 (4780-14670)	14670 (5100-19790)
			kW	3.5 (1.40-4.30)	4.3 (1.50-5.80)
Power input (1)			kW	0.95	1.16
EER (Cooling) or COP (Heating) (1)			W/W	3.67	3.62
Energy efficiency class				A	A
Power supply			V/Ph/Hz	220-240/1/50	
Rated current			A	3.67	4.8
Starting current			A	10.5	
Circuit breaker rating			A	16	
INDOOR	Fan type & quantity			Centrifugal & 2	
	Fan speeds	H/ M/ L	RPM	980/860/730	
	Air flow (2)	H/ M/ L	m³/hr	650/580/490	
	External static pressure	Min-Max	Pa	0-30	
	Sound power level (3)	H/ M/ L	dB(A)	53/49/45	
	Sound pressure level (4)	H/ M/ L	dB(A)	31/27/24	
	Moisture removal		L/hr	1.0	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	200x750x630	
	Weight		kg	20	
	Package dimensions	WxHxD	mm	885x695x226	
	Packaged weight		kg	23	
	Units per pallet		Units	14	
	Stacking height		Units	7	
OUTDOOR	Refrigerant control			Electronic Expansion Valve	
	Compressor type, model			DC Inverter single rotary	
	Fan type & quantity			Axial & 1	
	Air flow	H / L	m³/hr	1780	
	Sound power level	H / L	dB(A)	62	
	Sound pressure level (4)	H / L	dB(A)	52	
	Dimensions	WxHxD	mm	795x610x290	
	Weight		kg	38	
	Package dimensions	WxHxD	mm	945x655x395	
	Packaged weight		kg	43	
	Units per pallet		Units	9	
	Stacking height		Units	3	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg	1.2	
	Additional charge per 1 meter		g/m	No need	
	Connections between units	Liquid line	In.	1/4"	
		Suction line	In.	3/8"	
		Max. tubing length	m.	20	
		Max. height difference	m.	15	
Operation control type				I.R Remote control	
Heating elements			kW		
Others					

- (1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).
- (2) Airflow without external static pressure.
- (3) Sound power in ducted units is measured at air discharge.
- (4) Sound pressure level measured at 1-meter distance from unit.



## 2.3 DLF 50 DCI

Model Indoor Unit				DLF 50 DCI		
Model Outdoor Unit				DCI 50		
Installation method of Pipe				DUCTED		
Characteristics			Units	Cooling	Heating	
Capacity (1)			Btu/hr	17060 (5120-20470)	20470 (5120-25930)	
			kW	5.0 (1.50-6.00)	6.0 (1.50-7.60)	
Power input (1)			kW	1.5	1.73	
EER (Cooling) or COP (Heating) (1)			W/W	3.3	3.47	
Energy efficiency class				A	A	
Power supply			V/Ph/Hz	220-240/1/50		
Rated current			A	6.5	7.6	
Starting current			A	10.5		
Circuit breaker rating			A	20		
INDOOR	Fan type & quantity			Centrifugal & 2		
	Fan speeds		H/ M/ L	RPM	1100/980/860	
	Air flow (2)		H/ M/ L	m³/hr	710/600/540	
	External static pressure		Min-Max	Pa	0-40	
	Sound power level (3)		H/ M/ L	dB(A)	54/51/48	
	Sound pressure level (4)		H/ M/ L	dB(A)	35/32/29	
	Moisture removal			L/hr	1.5	
	Condensate drain tube I.D			mm	19	
	Dimensions		WxHxD	mm	750x630x200	
	Weight			kg	21	
	Package dimensions		WxHxD	mm	885x695x226	
	Packaged weight			kg	24	
	Units per pallet			Units	14	
	Stacking height			Units	7	
OUTDOOR	Refrigerant control			Electronic Expansion Valve		
	Compressor type, model			Scroll, DC		
	Fan type & quantity			Axial & 1		
	Air flow		H / L	m³/hr	2160	
	Sound power level		H / L	dB(A)	63	
	Sound pressure level (4)		H / L	dB(A)	53	
	Dimensions		WxHxD	mm	795x610x290	
	Weight			kg	39	
	Package dimensions		WxHxD	mm	945x655x395	
	Packaged weight			kg	43	
	Units per pallet			Units	9	
	Stacking height			Units	3	
	Refrigerant type			R410A		
	Refrigerant charge (standard connecting tubing length)			kg	1.5	
	Additional charge per 1 meter			g/m	No need	
	Connections between units	Liquid line			In.	1/4"
		Suction line			In.	1/2"
Max. tubing length			m.	30		
Max. height difference			m.	15		
Operation control type				I.R Remote control		
Heating elements			kW			
Others						

- (1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).
- (2) Airflow without external static pressure.
- (3) Sound power in ducted units is measured at air discharge.
- (4) Sound pressure level measured at 1-meter distance from unit.

## 2.4 DLF 60 DCI

Model Indoor Unit				DLF 60 DCI		
Model Outdoor Unit				DCI 60		
Installation method of Pipe				DUCTED		
Characteristics			Units	Cooling	Heating	
Capacity (1)			Btu/hr	20800 (5120-22860)	22520 (5120-26950)	
			kW	6.1 (1.50-6.70)	6.6 (1.50-7.90)	
Power input (1)			kW	1.9	1.7	
EER (Cooling) or COP (Heating) (1)			W/W	3.25	3.81	
Energy efficiency class				A	A	
Power supply			V/Ph/Hz	220-240/1/50		
Rated current			A	8.2	7.8	
Starting current			A	15		
Circuit breaker rating			A	20		
INDOOR	Fan type & quantity			Centrifugal & 3		
	Fan speeds		H/ M/ L	RPM	1170/1050/960	
	Air flow (2)		H/ M/ L	m³/hr	1100/950/880	
	External static pressure		Min-Max	Pa	0-40	
	Sound power level (3)		H/ M/ L	dB(A)	59/55/53	
	Sound pressure level (4)		H/ M/ L	dB(A)	38/34/32	
	Moisture removal			L/hr	1.7	
	Condensate drain tube I.D			mm	19	
	Dimensions		WxHxD	mm	1050x630x200	
	Weight			kg	25	
	Package dimensions		WxHxD	mm	1185x695x226	
	Packaged weight			kg	28	
	Units per pallet			Units	14	
	Stacking height			Units	7	
OUTDOOR	Refrigerant control			Electronic Expansion Valve		
	Compressor type, model			Scroll		
	Fan type & quantity			Axial & 1		
	Air flow		H / L	m³/hr	2860	
	Sound power level		H / L	dB(A)	65	
	Sound pressure level (4)		H / L	dB(A)	55	
	Dimensions		WxHxD	mm	846x690x302	
	Weight			kg	46	
	Package dimensions		WxHxD	mm	990x770x430	
	Packaged weight			kg	50	
	Units per pallet			Units	9	
	Stacking height			Units	3	
	Refrigerant type			R410A		
	Refrigerant charge (standard connecting tubing length)			kg	1.65	
	Additional charge per 1 meter			g/m	No need	
	Connections between units	Liquid line			In.	1/4"
		Suction line			In.	1/2"
		Max. tubing length			m.	30
		Max. height difference			m.	15
Operation control type				I.R Remote control		
Heating elements			kW			
Others						

- (1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).
- (2) Airflow without external static pressure.
- (3) Sound power in ducted units is measured at air discharge.
- (4) Sound pressure level measured at 1-meter distance from unit.

## 2.5 DLF 72 DCI

Model Indoor Unit				DLF 72 DCI		
Model Outdoor Unit				DCI 72Z		
Installation method of Pipe				DUCTED		
Characteristics			Units	Cooling	Heating	
Capacity (1)			Btu/hr	23880 (5120-25600)	25420 (5120-30020)	
			kW	7.0 (1.50-7.50)	7.45 (1.50-8.80)	
Power input (1)			kW	2.1	2.1	
EER (Cooling) or COP (Heating) (1)			W/W	3.4	3.68	
Energy efficiency class				A	A	
Power supply			V/Ph/Hz	220-240/1/50		
Rated current			A	9.3	9.3	
Starting current			A	15		
Circuit breaker rating			A	20		
INDOOR	Fan type & quantity			Centrifugal & 3		
	Fan speeds		H/ M/ L	RPM	1200/1050/980	
	Air flow (2)		H/ M/ L	m³/hr	1150/950/900	
	External static pressure		Min-Max	Pa	0-40	
	Sound power level (3)		H/ M/ L	dB(A)	63/59/56	
	Sound pressure level (4)		H/ M/ L	dB(A)	39/35/32	
	Moisture removal			L/hr	2.0	
	Condensate drain tube I.D			mm	19	
	Dimensions		WxHxD	mm	1050x630x200	
	Weight			kg	25	
	Package dimensions		WxHxD	mm	1185x695x226	
	Packaged weight			kg	28	
	Units per pallet			Units	14	
	Stacking height			Units	7	
OUTDOOR	Refrigerant control			Electronic Expansion Valve		
	Compressor type, model			Twin rotary		
	Fan type & quantity			Axial & 1		
	Air flow		H / L	m³/hr	3600	
	Sound power level		H / L	dB(A)	66	
	Sound pressure level (4)		H / L	dB(A)	56	
	Dimensions		WxHxD	mm	950x835x412	
	Weight			kg	65.5	
	Package dimensions		WxHxD	mm	1080x910x477	
	Packaged weight			kg	73	
	Units per pallet			Units	2	
	Stacking height			Units	2	
	Refrigerant type			R410A		
	Refrigerant charge (standard connecting tubing length)		kg	2.3		
	Additional charge per 1 meter		g/m	7.5m<Length≤20m:+0g; 20m<Length≤30m:+300g; 30m<Length≤50m; +1500g		
	Connections between units	Liquid line		In.	3/8"	
		Suction line		In.	5/8"	
		Max. tubing length		m.	50	
Max. height difference		m.	30			
Operation control type				I.R Remote control		
Heating elements			kW			
Others						

- (1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).
- (2) Airflow without external static pressure.
- (3) Sound power in ducted units is measured at air discharge.
- (4) Sound pressure level measured at 1-meter distance from unit.

### 3. RATING CONDITIONS

Standard conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.

**Cooling:**

Indoor: 27°C DB 19°C WB

Outdoor: 35°C DB

**Heating:**

Indoor: 20°C DB

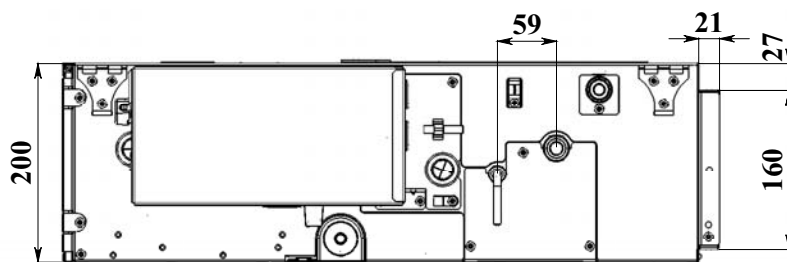
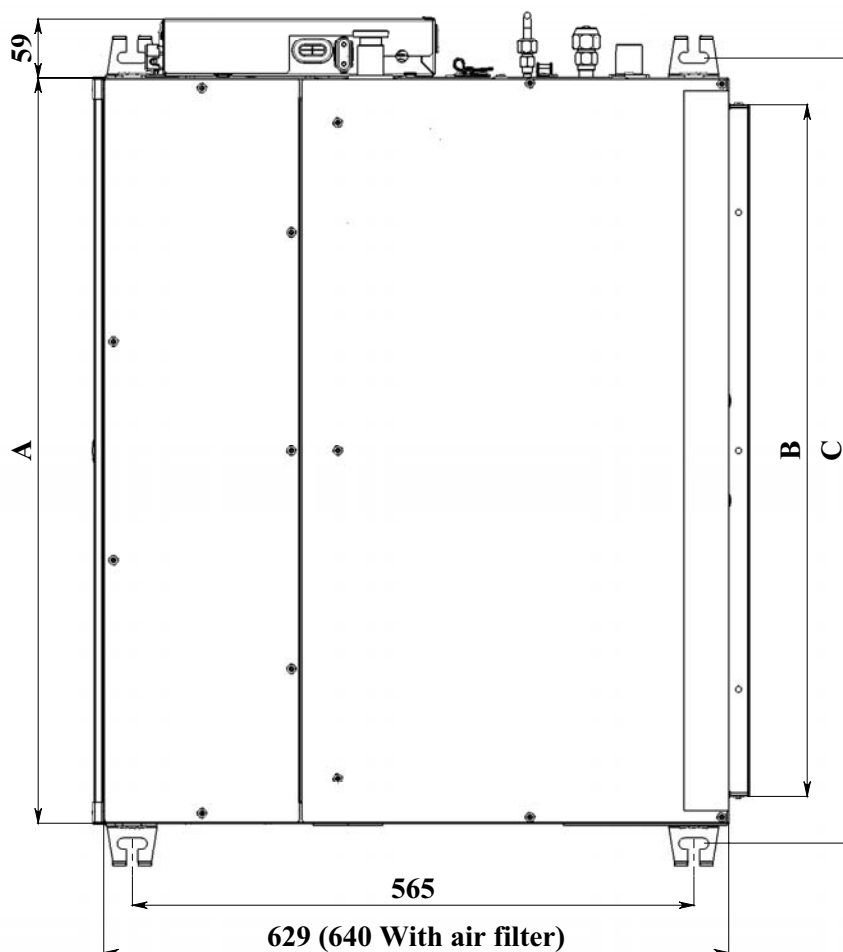
Outdoor: 7°C DB 6°C WB

#### 3.1 Operating Limits

		Indoor	Outdoor
<b>Cooling</b>	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	-10°C DB
<b>Heating</b>	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	20°C DB	-15°C DB -16°C WB
<b>Voltage</b>	1PH	198 – 264V	

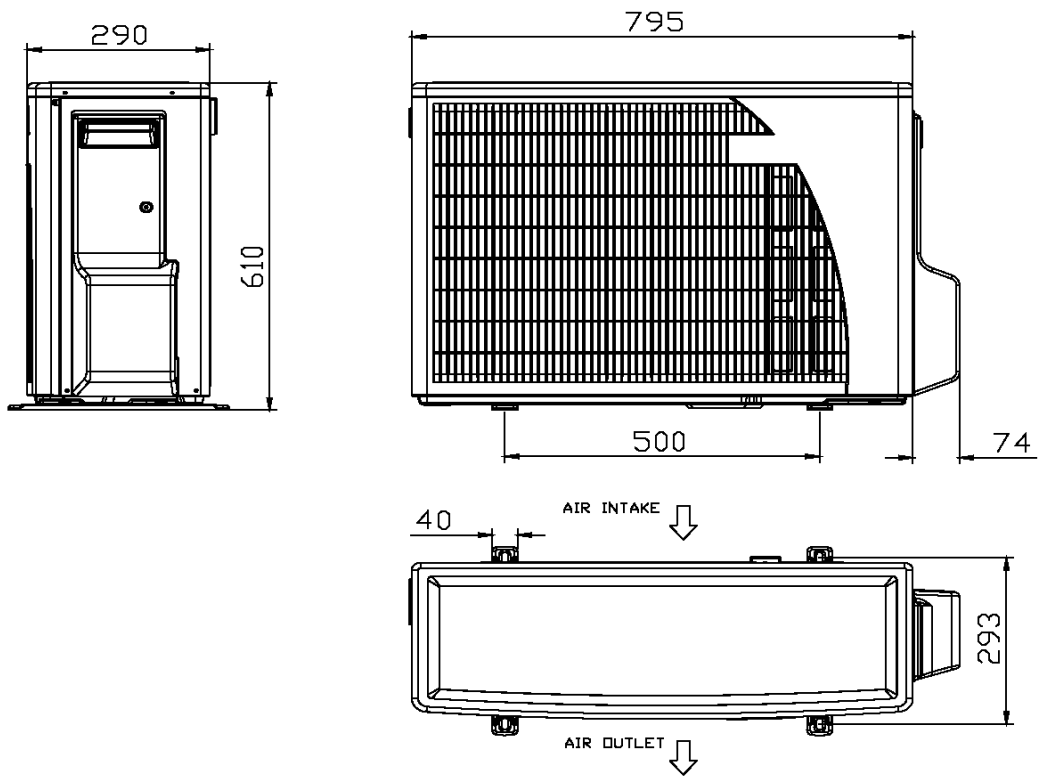
## 4. OUTLINE DIMENSIONS

### 4.1 Indoor Unit: DLF 25, 35, 50, 60, 72

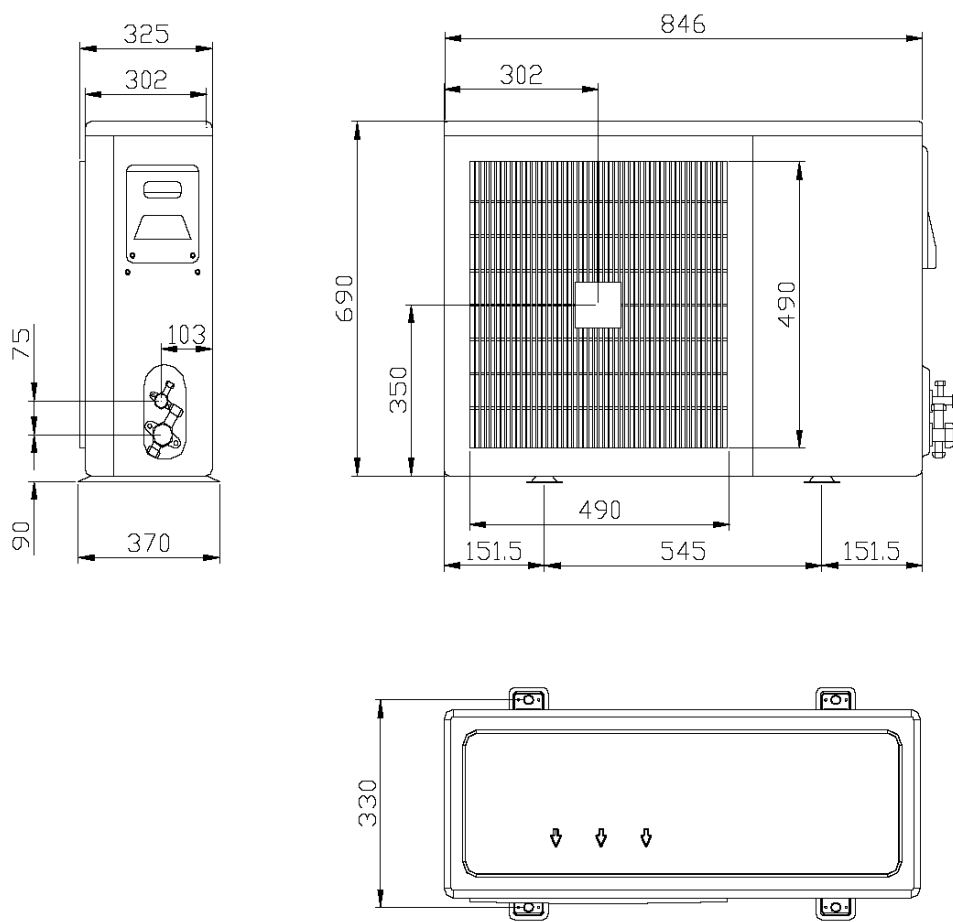


Nominal Capacity	A	B	C
2.5 -5.0 kW	750	696	790
6.0-7.2 kW	1050	996	1090

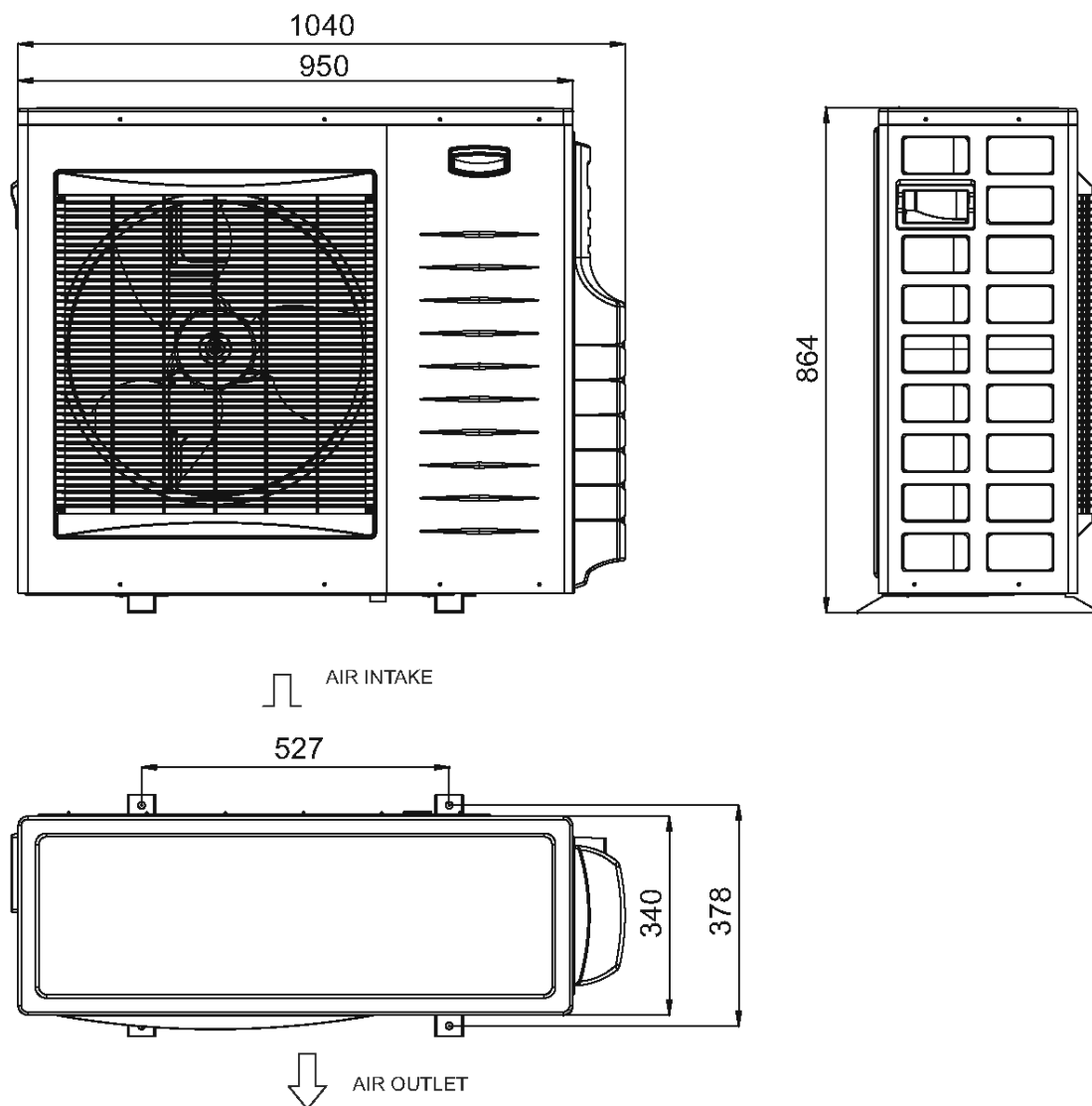
4.2 Outdoor Unit: DCI 25, 35, 50



4.3 Outdoor Unit: DCI 60



#### 4.4 Outdoor Unit: DCI 72Z



## 5. PERFORMANCE DATA & PRESSURE CURVES

### 5.1 DLF 25 / ONG3-25 DCI

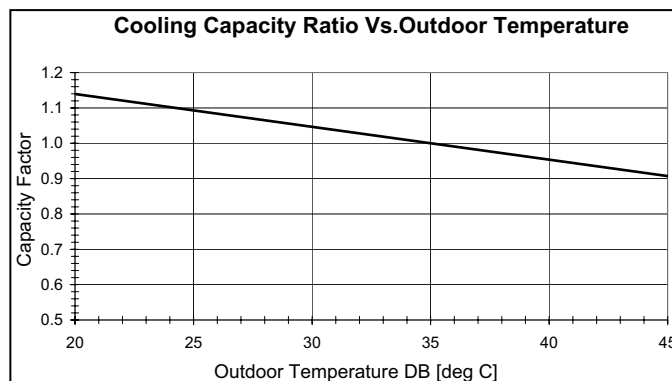
#### 5.1.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [C0]				
OD COIL ENTERING AIR DB TEMPERATURE [C°]	DATA	22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	2.42	2.57	2.73	2.89	3.05
	SC	2.02	2.06	2.10	2.14	2.18
	PI	0.49	0.50	0.51	0.52	0.52
30	TC	2.30	2.46	2.62	2.77	2.93
	SC	1.97	2.01	2.05	2.09	2.13
	PI	0.54	0.55	0.56	0.57	0.58
35	TC	2.18	2.34	<b>2.50</b>	2.66	2.82
	SC	1.92	1.96	<b>2.00</b>	2.04	2.08
	PI	0.60	0.61	<b>0.62</b>	0.63	0.64
40	TC	2.07	2.23	2.38	2.54	2.70
	SC	1.87	1.91	1.95	1.99	2.03
	PI	0.66	0.67	0.68	0.69	0.70
46	TC	1.93	2.09	2.24	2.40	2.56
	SC	1.81	1.85	1.89	1.93	1.97
	PI	0.73	0.74	0.75	0.75	0.76

#### LEGEND

- TC – Total Cooling Capacity, kW
- SC – Sensible Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OD – Outdoor

#### 5.1.2 Capacity Correction Factors (Cooling)





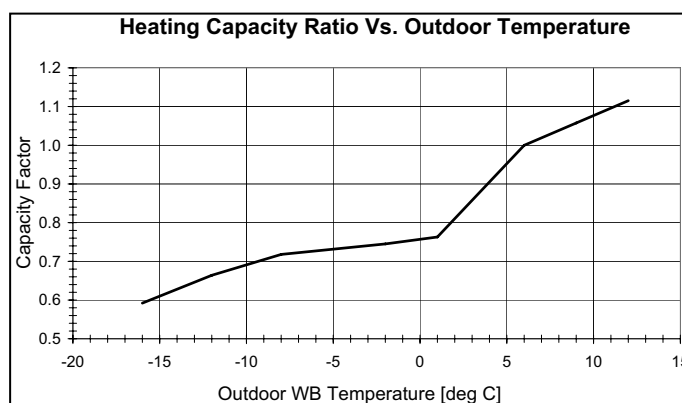
### 5.1.3 Heating

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	15	20	25
-15/-16	TC	2.16	2.01	1.86
	PI	0.52	0.58	0.63
-10/-12	TC	2.41	2.26	2.11
	PI	0.63	0.68	0.74
-7/-8	TC	2.59	2.44	2.29
	PI	0.71	0.76	0.82
-1/-2	TC	2.68	2.53	2.38
	PI	0.78	0.83	0.88
2/1	TC	2.75	2.59	2.44
	PI	0.82	0.87	0.92
7/6	TC	3.55	3.40	3.25
	PI	0.82	0.87	0.92
10/9	TC	3.75	3.60	3.44
	PI	0.87	0.92	0.97
15/12	TC	3.94	3.79	3.64
	PI	0.91	0.97	1.02
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

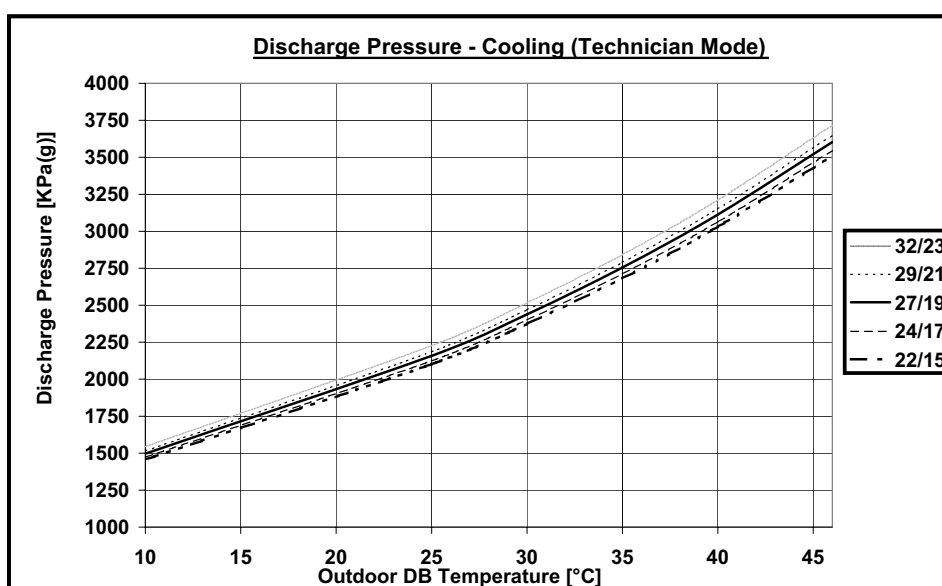
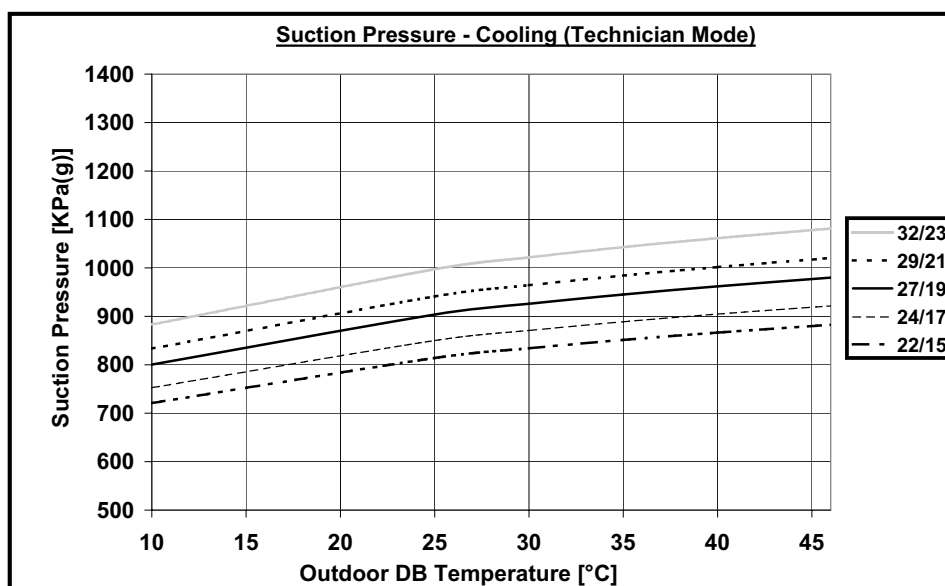
#### LEGEND

TH – Total Heating Capacity, kW  
 PI – Power Input, kW  
 WB – Wet Bulb Temp., (°C)  
 DB – Dry Bulb Temp., (°C)  
 ID – Indoor  
 OD – Outdoor

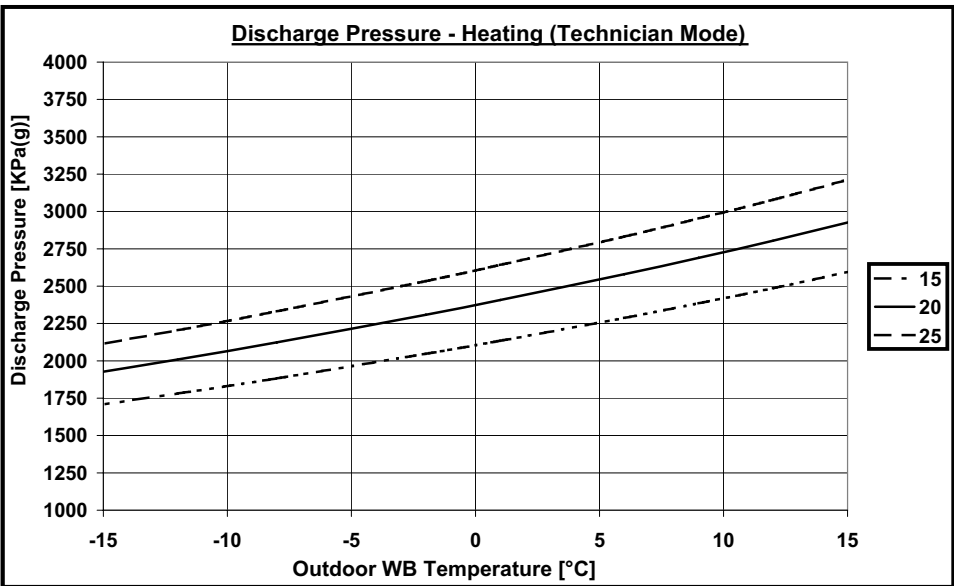
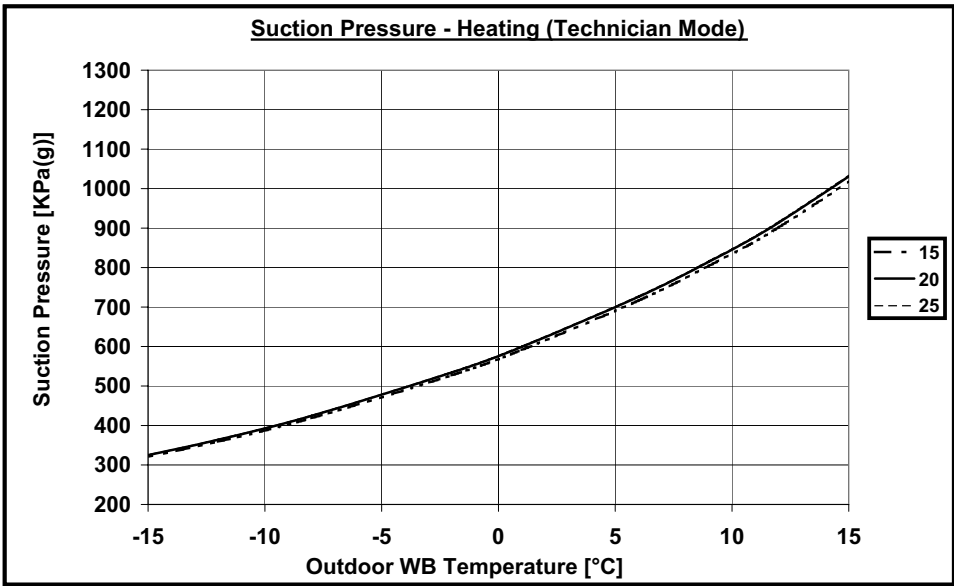
### 5.1.4 Capacity Correction Factors (Heating)



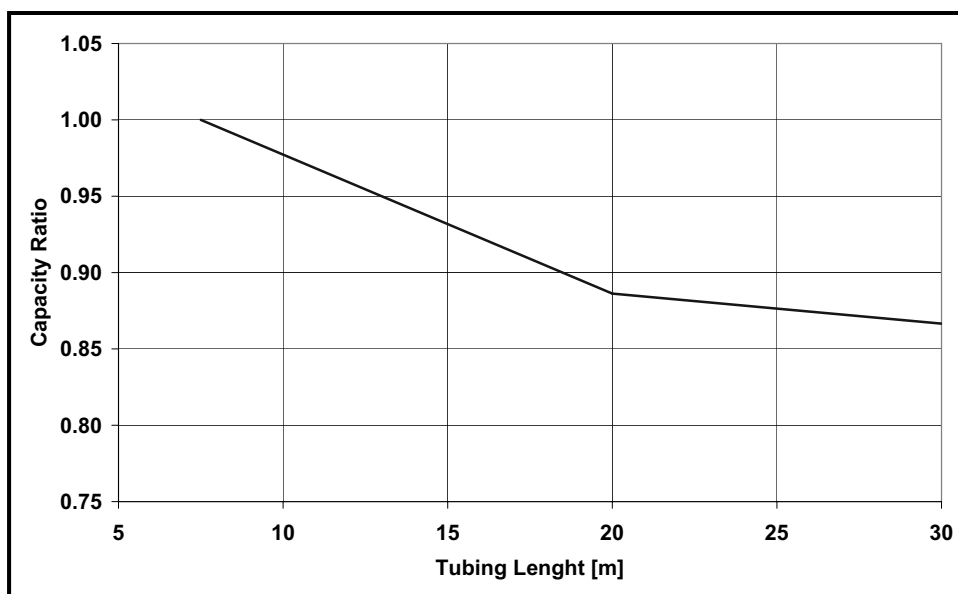
### 5.1.5 Pressure Curves (Cooling – Test Mode)



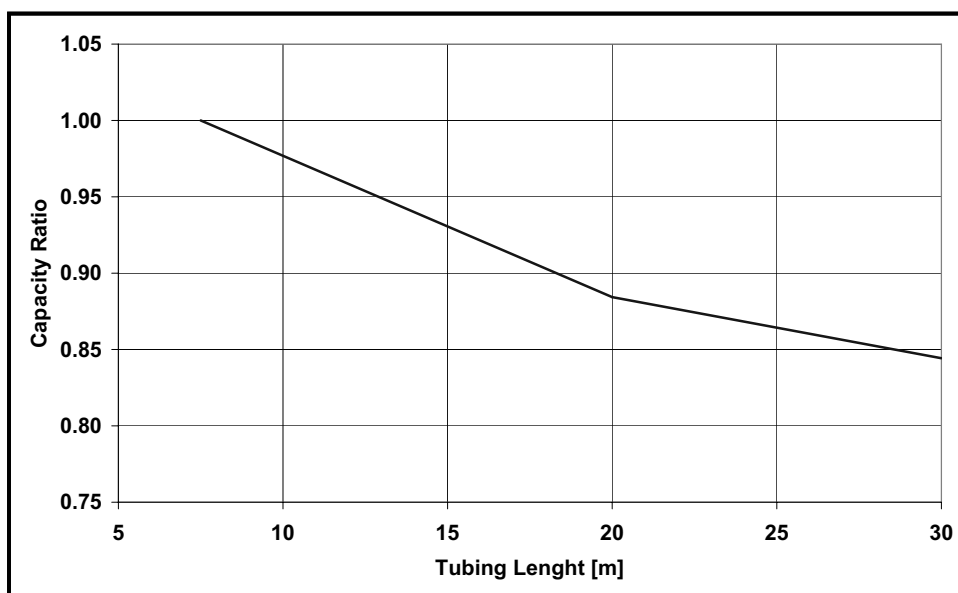
5.1.6 Pressure Curves (Heating – Test Mode)



### 5.1.7 Capacity Correction Factor Due to Tubing Length Cooling



### Heating



## 5.2 DLF 35 / ONG3-35 DCI

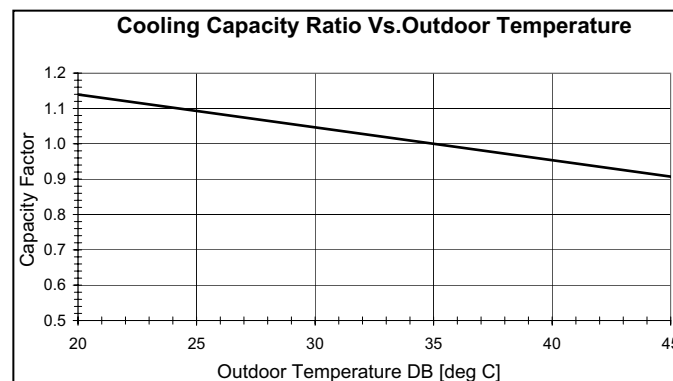
### 5.2.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [C0]				
OD COIL ENTERING AIR DB TEMPERATURE [C0]	DATA	22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	3.38	3.60	3.83	4.05	4.27
	SC	2.76	2.81	2.87	2.93	2.98
	PI	0.75	0.76	0.78	0.79	0.80
30	TC	3.22	3.44	3.66	3.88	4.11
	SC	2.69	2.74	2.80	2.86	2.91
	PI	0.83	0.85	0.86	0.88	0.89
35	TC	3.06	3.28	3.50	3.72	3.94
	SC	2.62	2.67	2.73	2.79	2.84
	PI	0.92	0.94	0.95	0.96	0.98
40	TC	2.89	3.12	3.34	3.56	3.78
	SC	2.55	2.60	2.66	2.72	2.77
	PI	1.01	1.02	1.04	1.05	1.07
46	TC	2.70	2.92	3.14	3.36	3.58
	SC	2.46	2.52	2.58	2.63	2.69
	PI	1.11	1.13	1.14	1.16	1.17

#### LEGEND

- TC – Total Cooling Capacity, kW
- SC – Sensible Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OD – Outdoor

### 5.2.2 Capacity Correction Factors (Cooling)



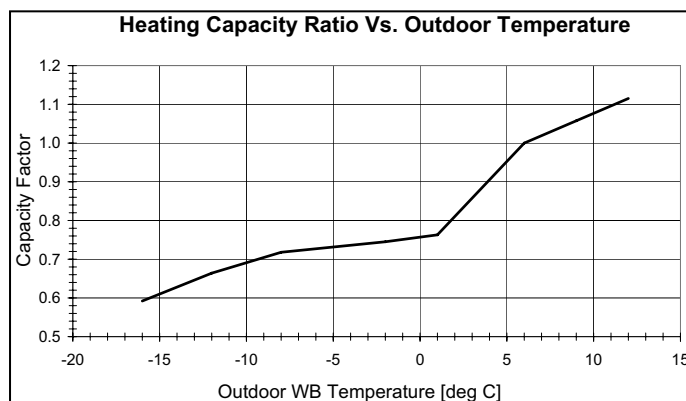
### 5.2.3 Heating

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	15	20	25
-15/-16	TC	2.67	2.49	2.30
	PI	0.70	0.77	0.84
-10/-12	TC	2.98	2.79	2.60
	PI	0.84	0.91	0.98
-7/-8	TC	3.20	3.02	2.83
	PI	0.95	1.02	1.09
-1/-2	TC	3.32	3.13	2.94
	PI	1.00	1.07	1.14
2/1	TC	3.39	3.20	3.02
	PI	1.04	1.11	1.18
7/6	TC	4.39	<b>4.20</b>	4.01
	PI	1.09	<b>1.16</b>	1.23
10/9	TC	4.63	4.44	4.26
	PI	1.15	1.23	1.30
15/12	TC	4.87	4.68	4.50
	PI	1.22	1.29	1.36
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

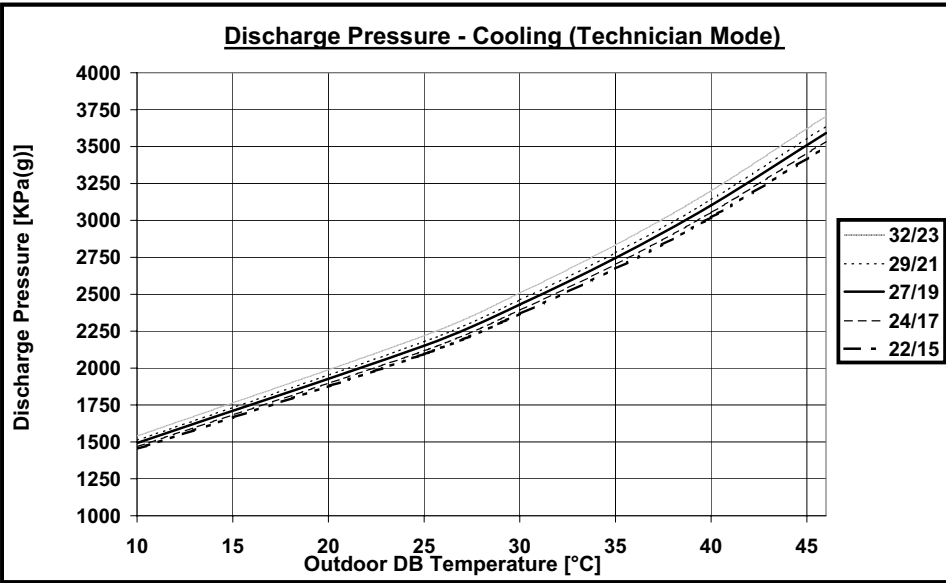
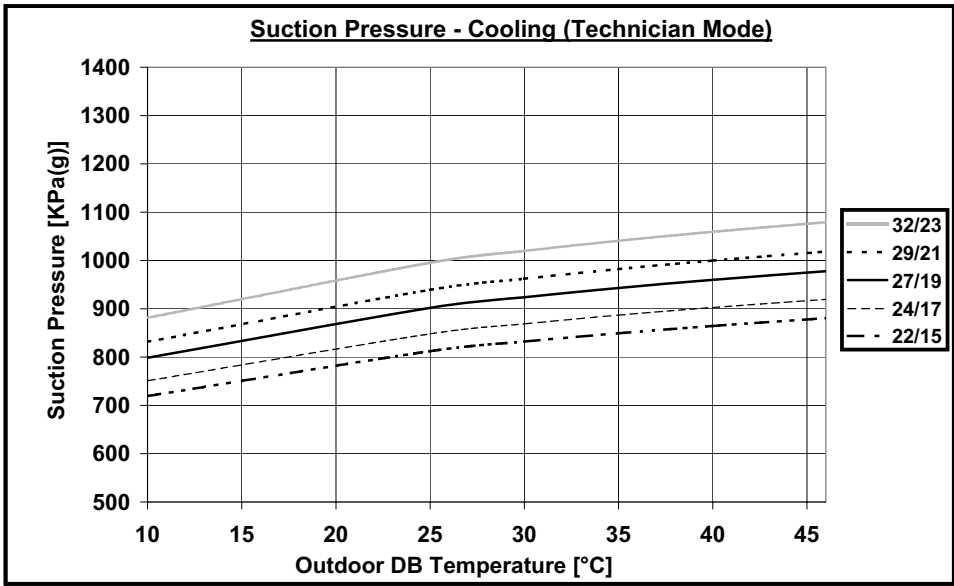
#### **LEGEND**

TH – Total Heating Capacity, kW  
 PI – Power Input, kW  
 WB – Wet Bulb Temp., (°C)  
 DB – Dry Bulb Temp., (°C)  
 ID – Indoor  
 OD – Outdoor

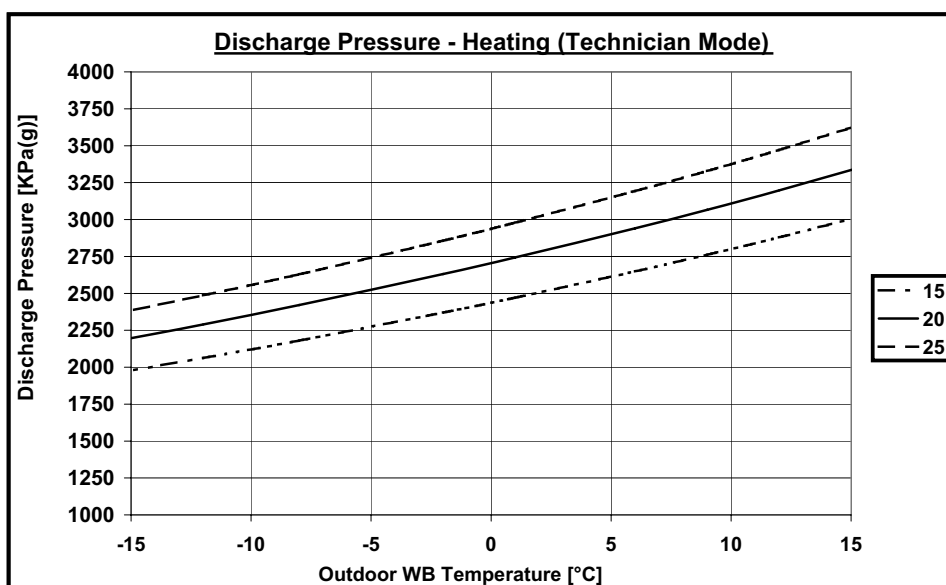
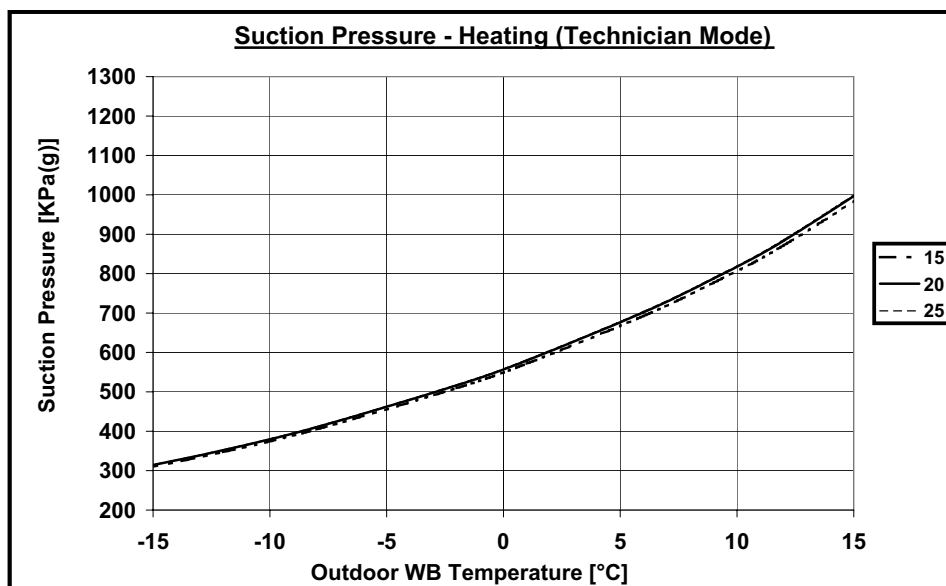
### 5.2.4 Capacity Correction Factors (Heating)



5.2.5 Pressure Curves (Cooling – Test Mode)

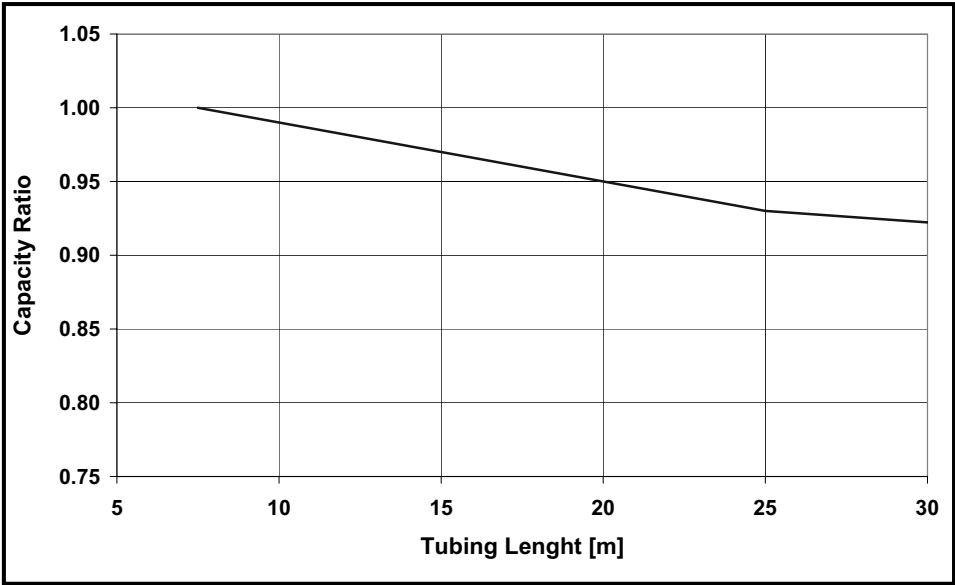


## 5.2.6 Pressure Curves (Heating – Test Mode)

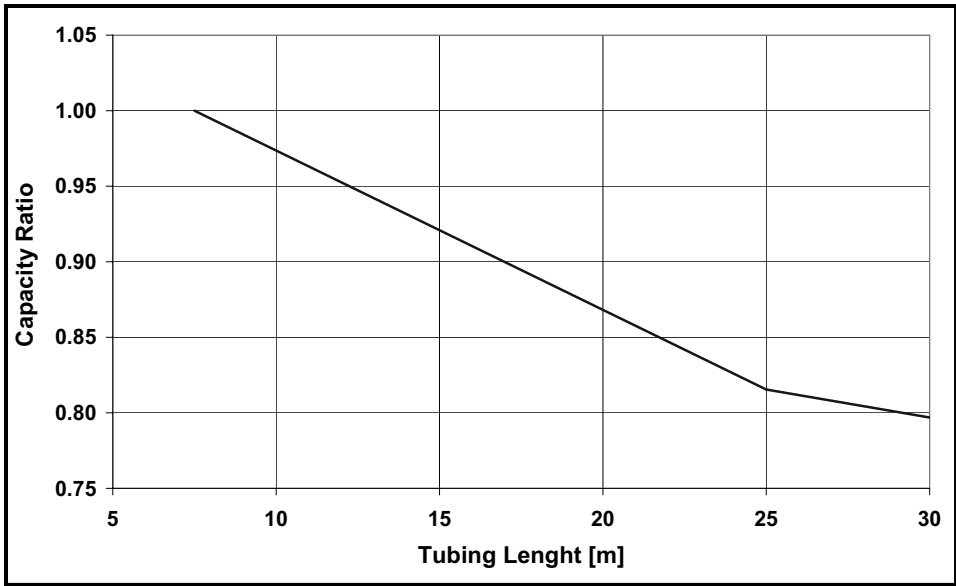




5.2.7 Capacity Correction Factor Due to Tubing Length  
Cooling



Heating



### 5.3 DLF 50 / ONG3-50 DCI

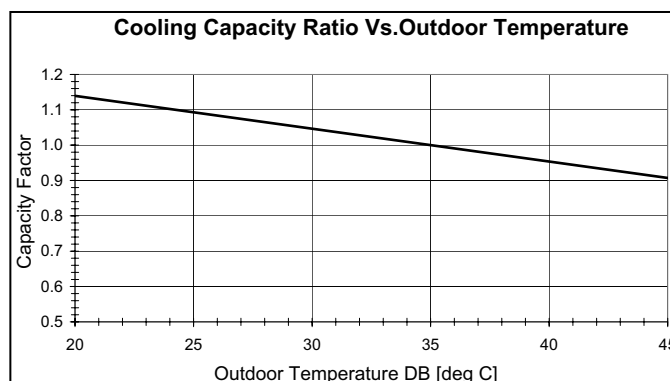
#### 5.3.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [C0]				
OD COIL ENTERING AIR DB TEMPERATURE [C0]	DATA	22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	4.83	5.15	5.47	5.78	6.10
	SC	3.74	3.81	3.89	3.96	4.04
	PI	1.18	1.20	1.22	1.25	1.27
30	TC	4.60	4.92	5.23	5.55	5.86
	SC	3.64	3.72	3.79	3.87	3.95
	PI	1.32	1.34	1.36	1.38	1.41
35	TC	4.37	4.68	5.00	5.32	5.63
	SC	3.55	3.62	3.70	3.78	3.85
	PI	1.46	1.48	1.50	1.52	1.55
40	TC	4.14	4.45	4.77	5.08	5.40
	SC	3.45	3.53	3.61	3.68	3.76
	PI	1.59	1.62	1.64	1.66	1.68
46	TC	3.86	4.17	4.49	4.80	5.12
	SC	3.34	3.42	3.49	3.57	3.64
	PI	1.76	1.78	1.80	1.83	1.85

#### LEGEND

- TC – Total Cooling Capacity, kW
- SC – Sensible Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OD – Outdoor

#### 5.3.2 Capacity Correction Factors (Cooling)



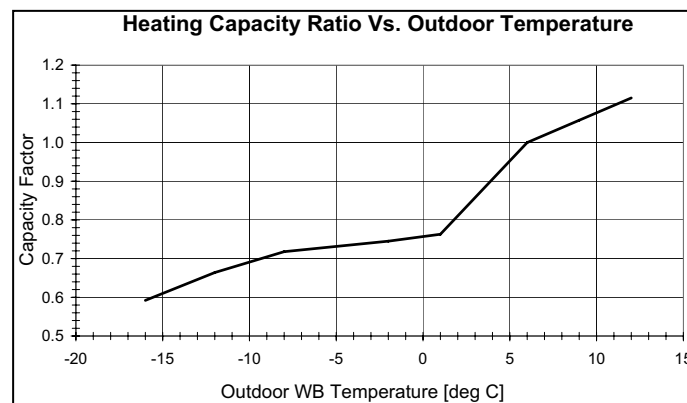
### 5.3.3 Heating

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	15	20	25
-15/-16	TC	3.88	3.61	3.34
	PI	1.04	1.14	1.25
-10/-12	TC	4.32	4.05	3.78
	PI	1.25	1.36	1.46
-7/-8	TC	4.65	4.38	4.11
	PI	1.41	1.52	1.62
-1/-2	TC	4.82	4.54	4.27
	PI	1.49	1.60	1.70
2/1	TC	4.93	4.65	4.38
	PI	1.54	1.65	1.76
7/6	TC	6.37	6.00	5.83
	PI	1.62	1.73	1.84
10/9	TC	6.72	6.45	6.18
	PI	1.72	1.83	1.93
15/12	TC	7.07	6.80	6.53
	PI	1.82	1.92	2.03
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

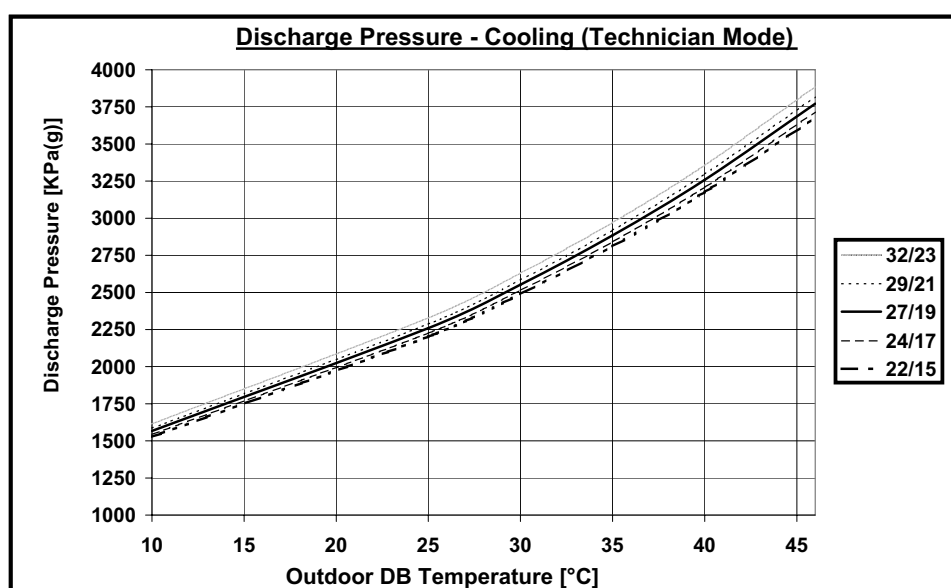
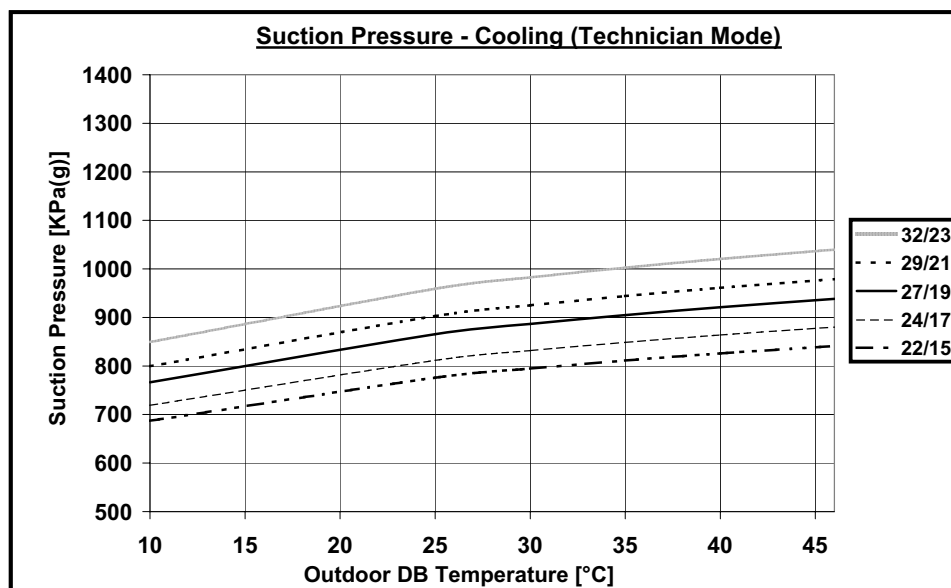
#### LEGEND

TH – Total Heating Capacity, kW  
 PI – Power Input, kW  
 WB – Wet Bulb Temp., (°C)  
 DB – Dry Bulb Temp., (°C)  
 ID – Indoor  
 OD – Outdoor

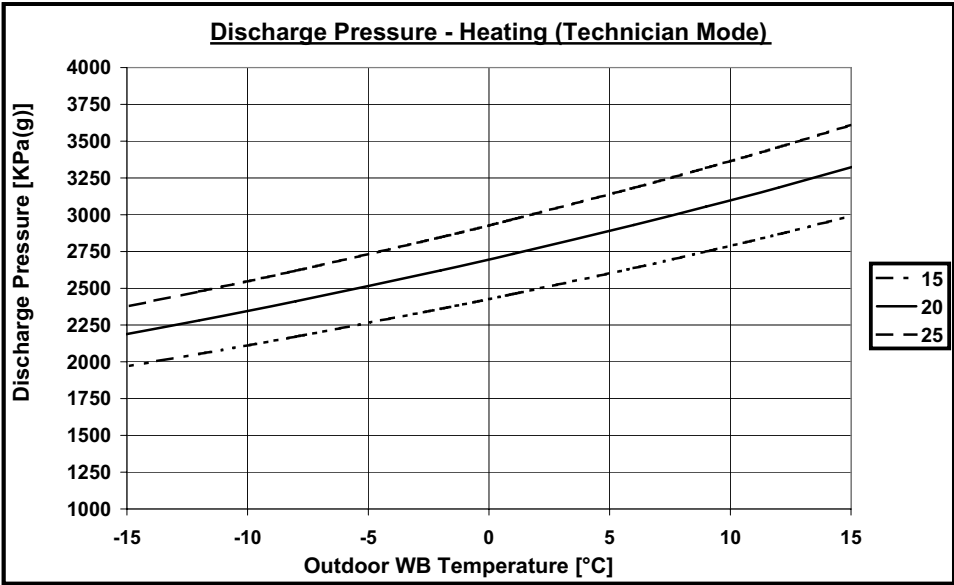
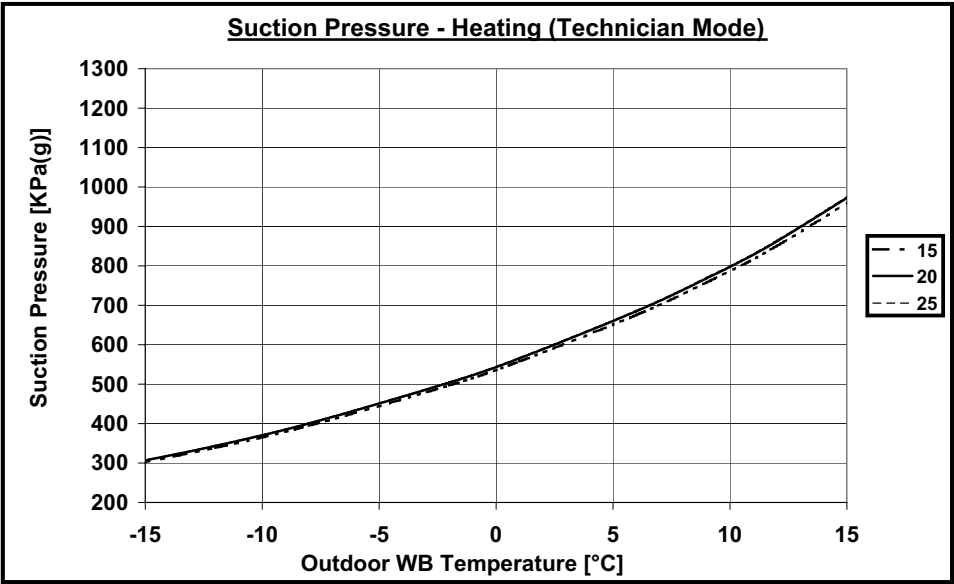
### 5.3.4 Capacity Correction Factors (Heating)



### 5.3.5 Pressure Curves (Cooling – Test Mode)

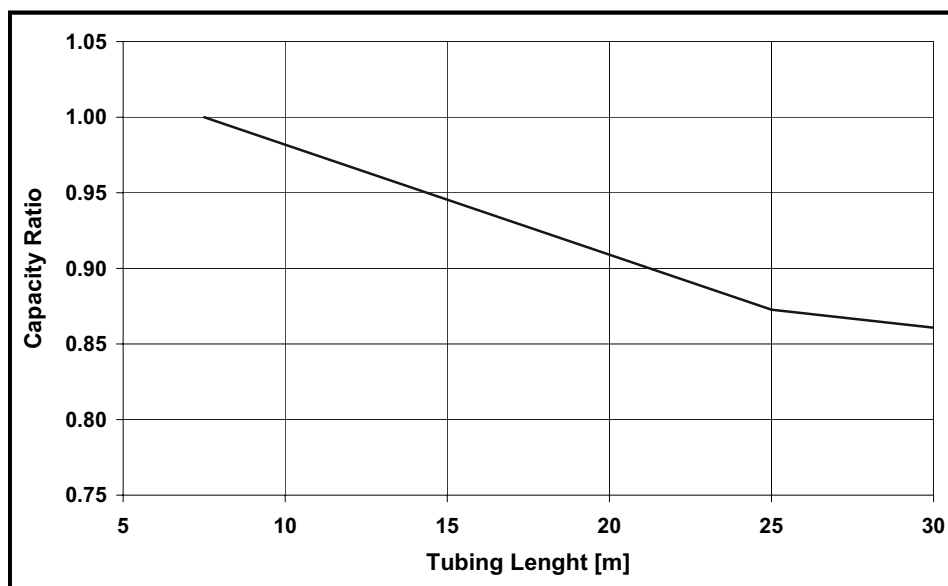


5.3.6 Pressure Curves (Heating – Test Mode)

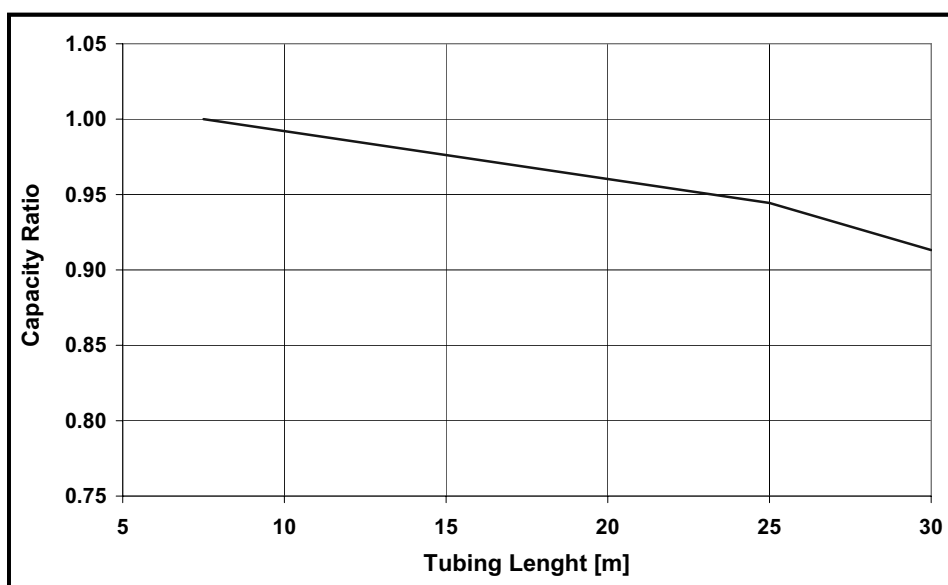


### 5.3.7 Capacity Correction Factor Due to Tubing Length

#### Cooling



#### Heating



## 5.4 DLF 60 / DCI 60 (GC24)

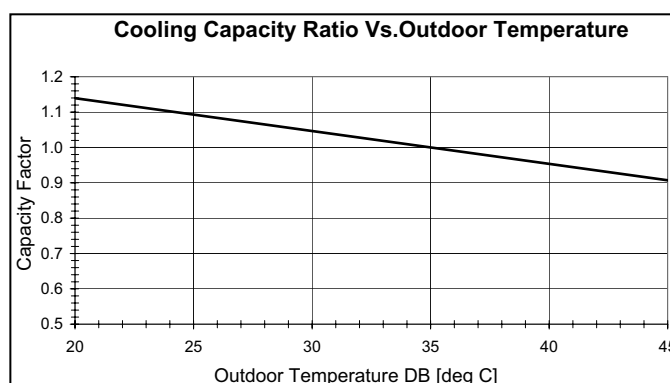
### 5.4.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [C0]				
OD COIL ENTERING AIR DB TEMPERATURE [C0]	DATA	22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	5.80	6.18	6.56	6.94	7.32
	SC	4.73	4.82	4.92	5.02	5.11
	PI	1.48	1.51	1.53	1.56	1.59
30	TC	5.52	5.90	6.28	6.66	7.04
	SC	4.61	4.70	4.80	4.90	4.99
	PI	1.65	1.68	1.71	1.74	1.76
35	TC	5.24	5.62	6.10	6.38	6.76
	SC	4.49	4.58	4.68	4.78	4.87
	PI	1.82	1.85	1.88	1.91	1.94
40	TC	4.96	5.34	5.72	6.10	6.48
	SC	4.37	4.46	4.56	4.66	4.75
	PI	2.00	2.02	2.05	2.08	2.11
46	TC	4.63	5.01	5.39	5.77	6.14
	SC	4.22	4.32	4.42	4.51	4.61
	PI	2.20	2.23	2.26	2.29	2.32

#### LEGEND

- TC – Total Cooling Capacity, kW
- SC – Sensible Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OD – Outdoor

### 5.4.2 Capacity Correction Factors (Cooling)



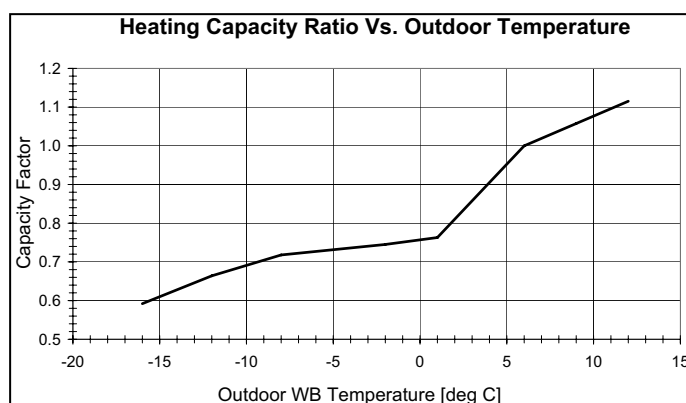
### 5.4.3 Heating

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	15	20	25
-15/-16	TC	4.20	3.91	3.61
	PI	1.04	1.14	1.26
-10/-12	TC	4.68	4.38	4.09
	PI	1.25	1.36	1.46
-7/-8	TC	5.03	4.74	4.45
	PI	1.41	1.52	1.62
-1/-2	TC	5.21	4.92	4.62
	PI	1.49	1.60	1.70
2/1	TC	5.33	5.04	4.74
	PI	1.54	1.65	1.76
7/6	TC	6.89	<b>6.60</b>	6.31
	PI	1.62	<b>1.73</b>	1.84
10/9	TC	7.27	6.98	6.69
	PI	1.72	1.83	1.93
15/12	TC	7.65	7.36	7.07
	PI	1.82	1.92	2.03
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

#### LEGEND

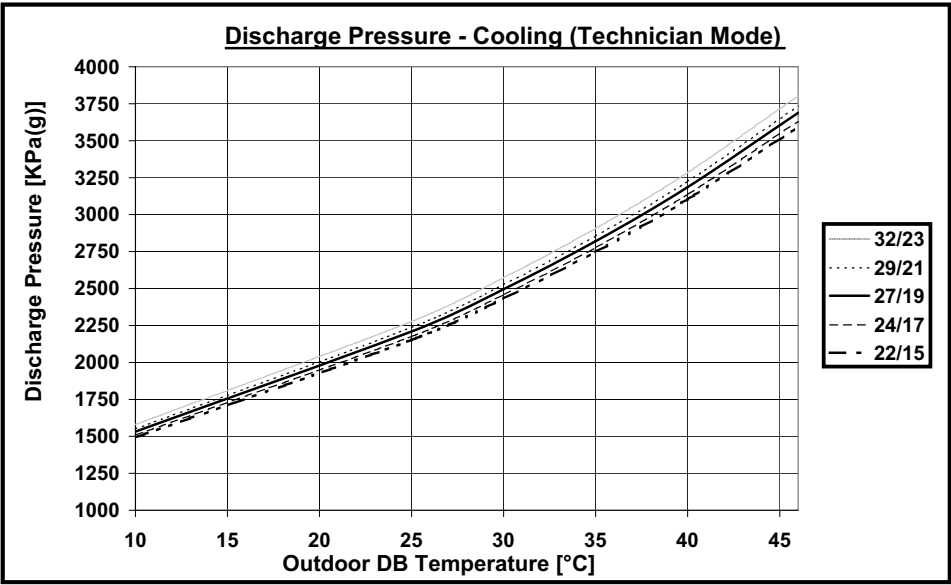
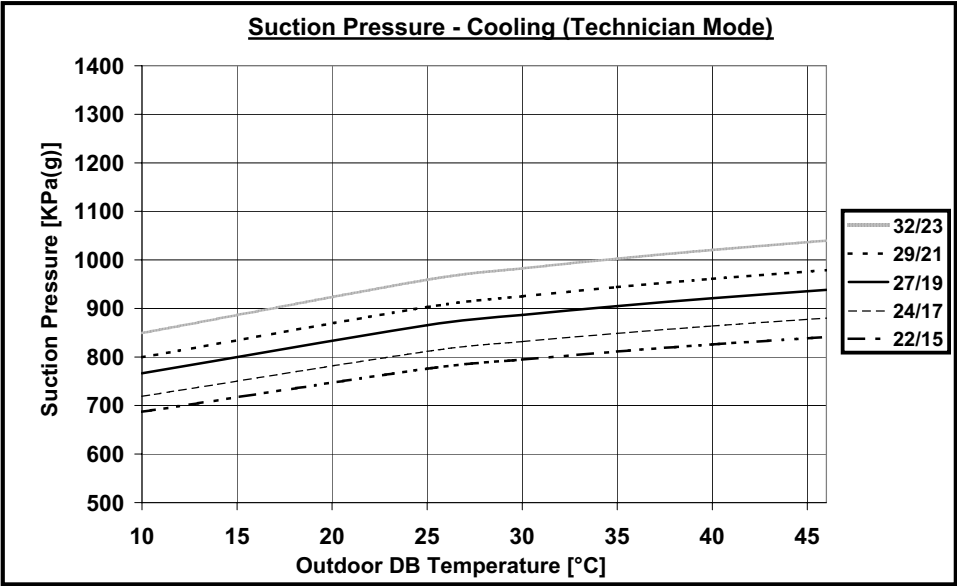
TH – Total Heating Capacity, kW  
 PI – Power Input, kW  
 WB – Wet Bulb Temp., (°C)  
 DB – Dry Bulb Temp., (°C)  
 ID – Indoor  
 OD – Outdoor

### 5.4.4 Capacity Correction Factors (Heating)

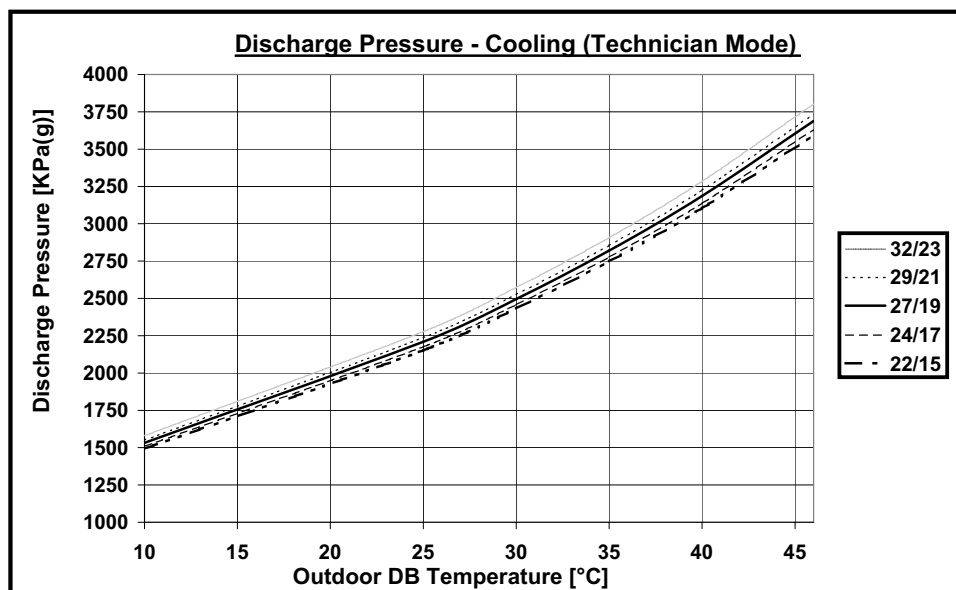
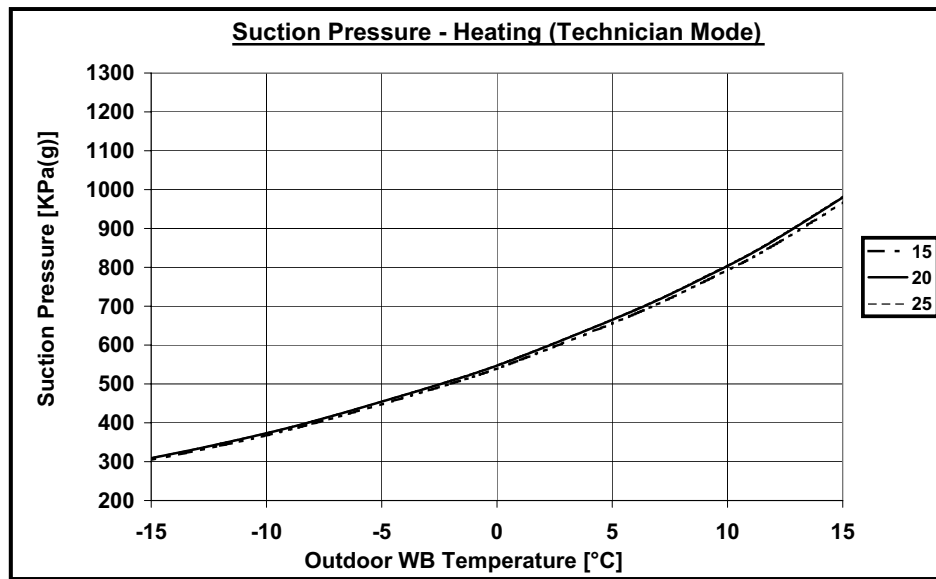




5.4.5 Pressure Curves (Cooling – Test Mode)

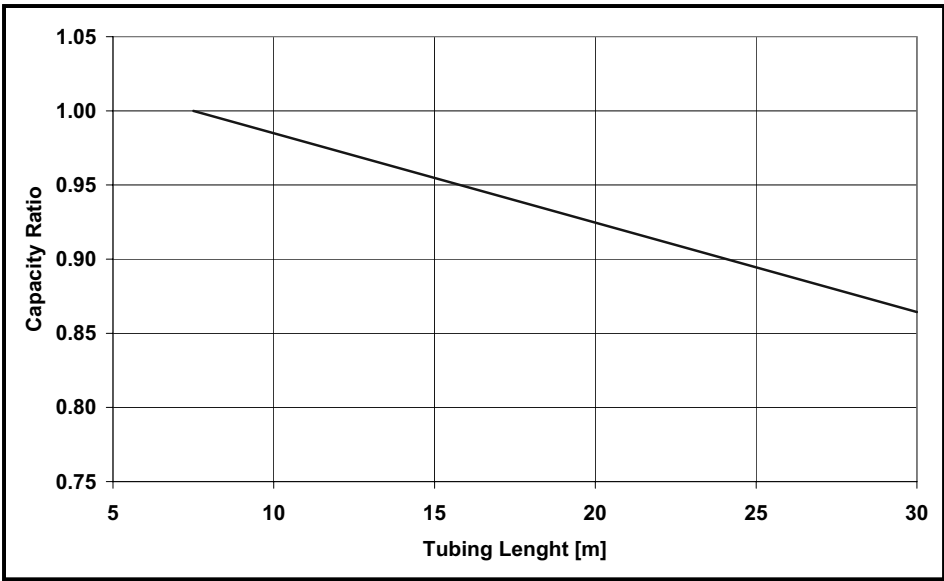


### 5.4.6 Pressure Curves (Heating – Test Mode)

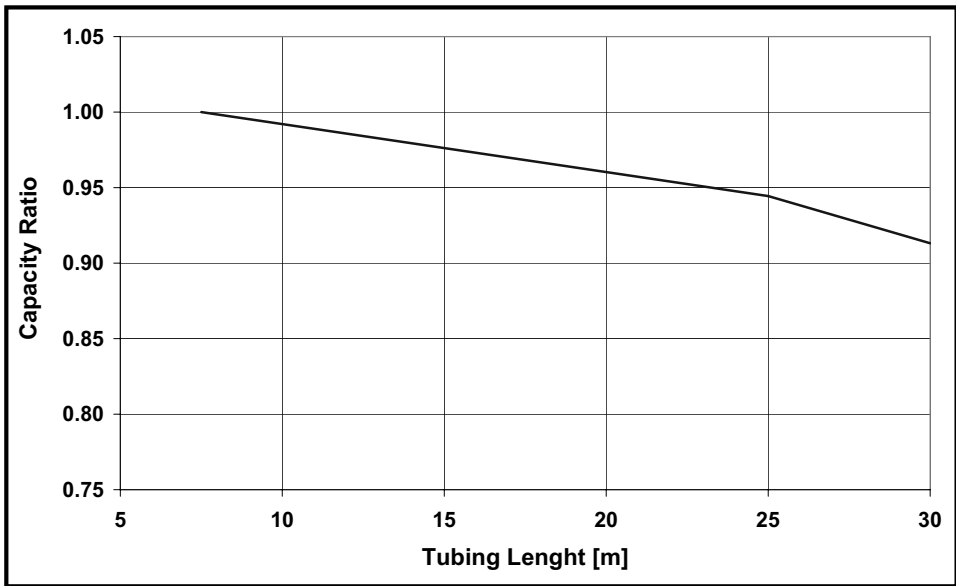


5.4.7 Capacity Correction Factor Due to Tubing Length

Cooling



Heating



## 5.5 DLF 72 / DCI 72Z

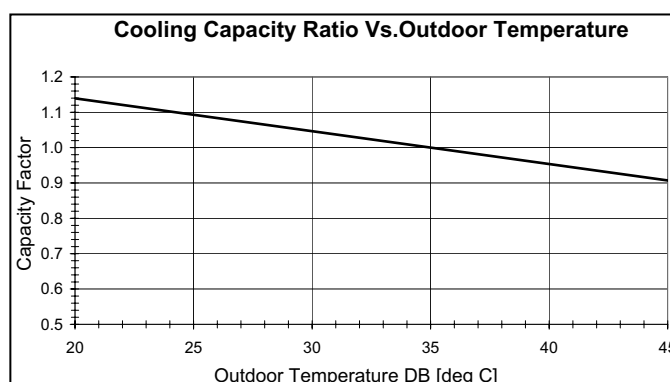
### 5.5.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [C0]				
OD COIL ENTERING AIR DB TEMPERATURE [C0]	DATA	22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	6.77	7.21	7.65	8.09	8.54
	SC	5.51	5.63	5.74	5.85	5.96
	PI	1.61	1.64	1.67	1.70	1.73
30	TC	6.44	6.88	7.33	7.77	8.21
	SC	5.37	5.49	5.60	5.71	5.82
	PI	1.80	1.83	1.86	1.89	1.92
35	TC	6.12	6.56	<b>7.00</b>	7.44	7.88
	SC	5.24	5.35	<b>5.46</b>	5.57	5.68
	PI	1.99	2.02	<b>2.05</b>	2.08	2.11
40	TC	5.79	6.23	6.67	7.12	7.56
	SC	5.10	5.21	5.32	5.43	5.55
	PI	2.18	2.21	2.24	2.27	2.30
46	TC	5.40	5.84	6.28	6.73	7.17
	SC	4.93	5.04	5.15	5.27	5.38
	PI	2.40	2.43	2.46	2.50	2.53

#### LEGEND

- TC – Total Cooling Capacity, kW
- SC – Sensible Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OD – Outdoor

### 5.5.2 Capacity Correction Factors (Cooling)



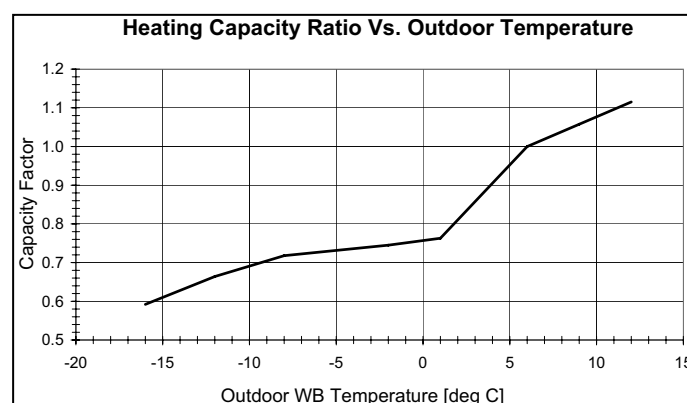
### 5.5.3 Heating

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	15	20	25
-15/-16	TC	7.74	4.41	4.08
	PI	1.21	1.34	1.46
-10/-12	TC	5.28	4.95	4.62
	PI	1.46	1.58	1.71
-7/-8	TC	5.68	5.35	5.02
	PI	1.65	1.77	1.89
-1/-2	TC	5.88	5.55	5.22
	PI	1.74	1.86	1.99
2/1	TC	6.02	5.68	5.35
	PI	1.80	1.93	2.05
7/6	TC	7.78	7.45	7.12
	PI	1.90	2.02	2.14
10/9	TC	8.21	7.88	7.55
	PI	2.01	2.13	2.26
15/12	TC	8.64	8.31	7.98
	PI	2.12	2.25	2.37
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

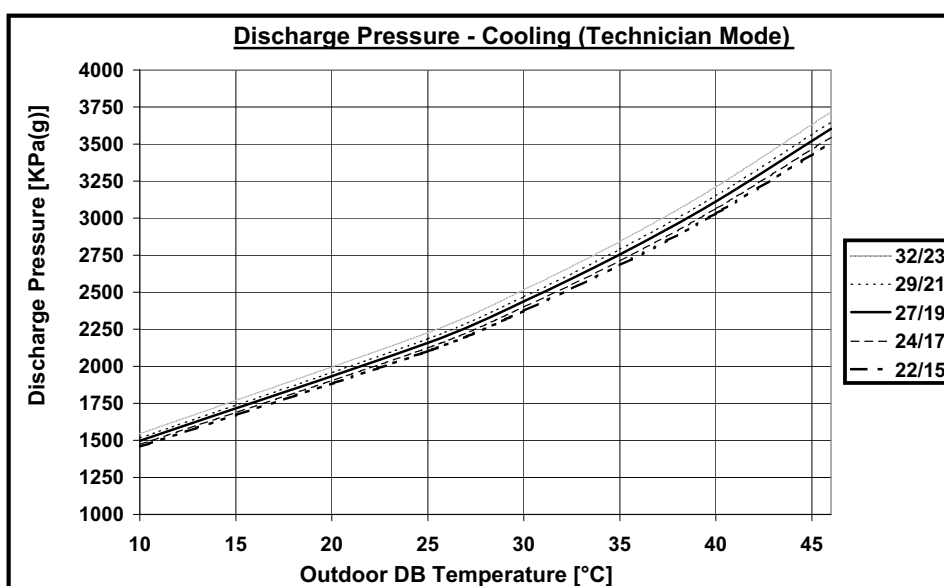
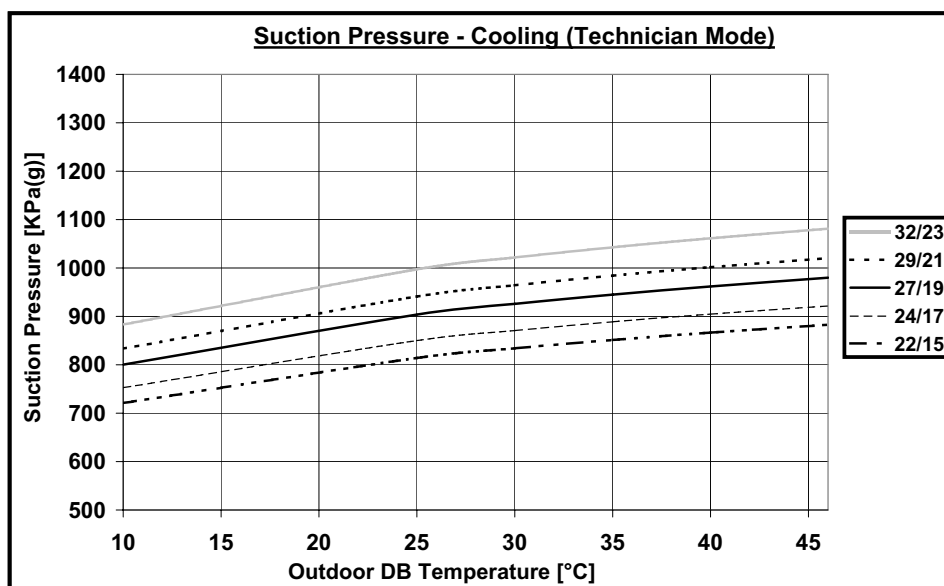
#### LEGEND

TH – Total Heating Capacity, kW  
 PI – Power Input, kW  
 WB – Wet Bulb Temp., (°C)  
 DB – Dry Bulb Temp., (°C)  
 ID – Indoor  
 OD – Outdoor

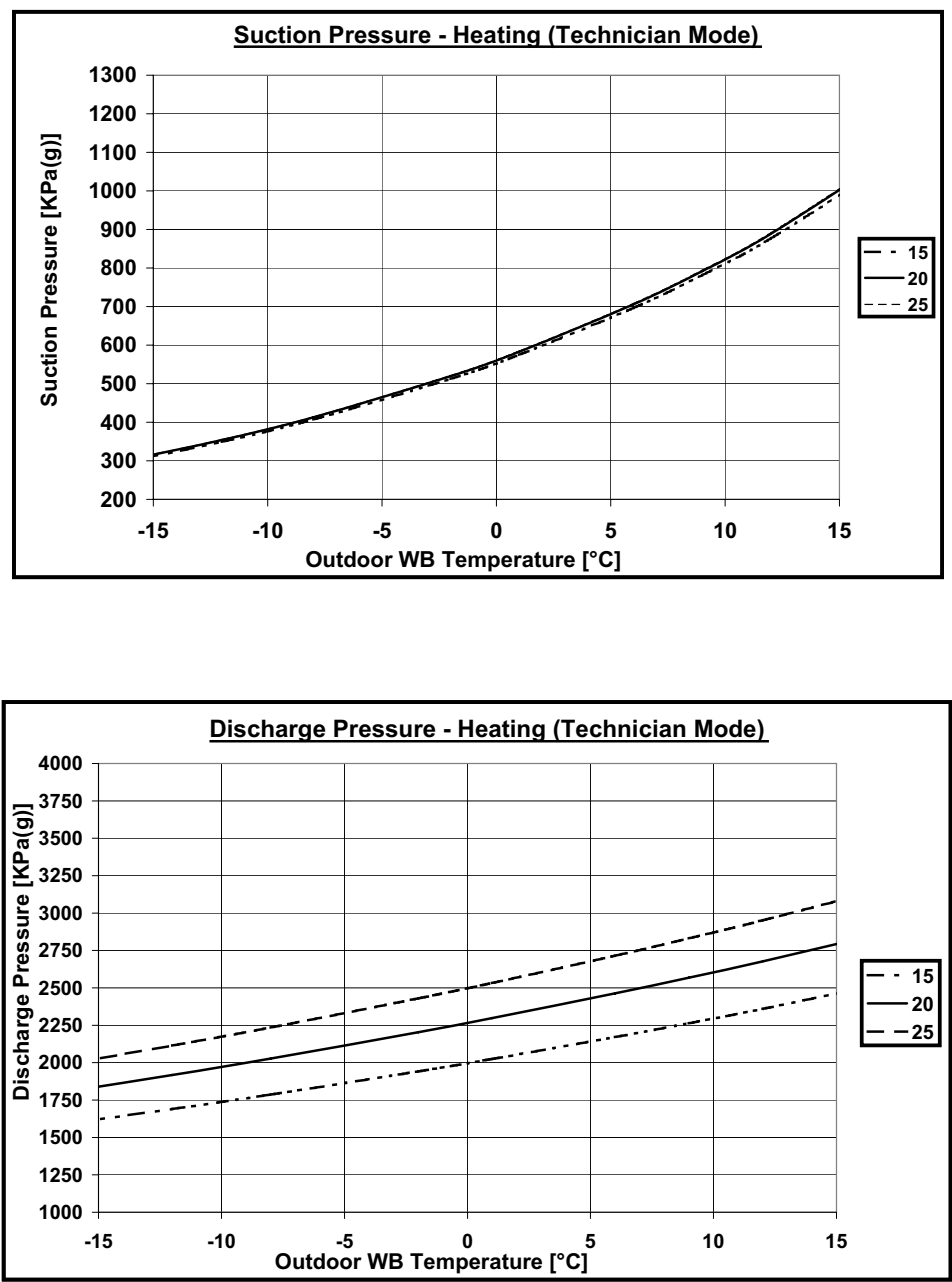
### 5.5.4 Capacity Correction Factors (Heating)



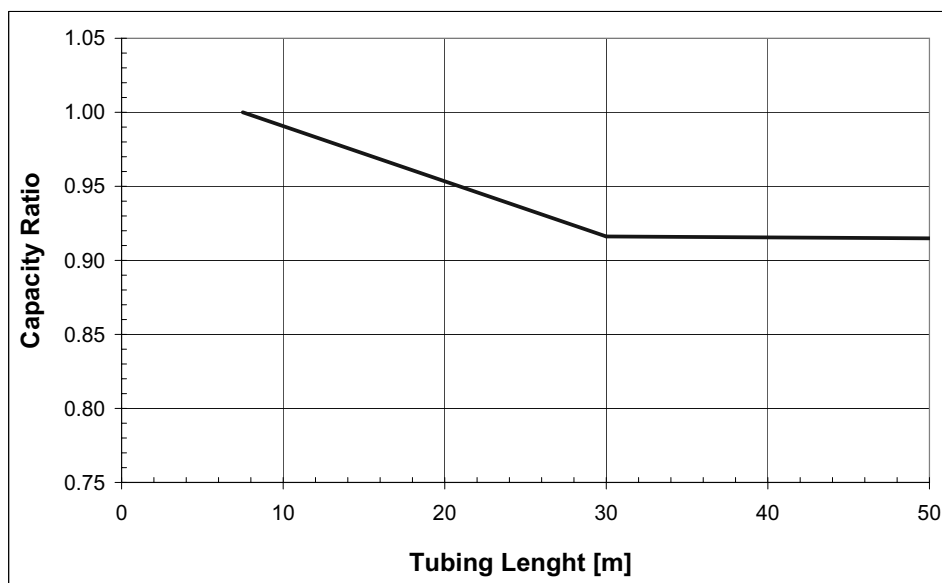
### 5.5.5 Pressure Curves (Cooling – Test Mode)



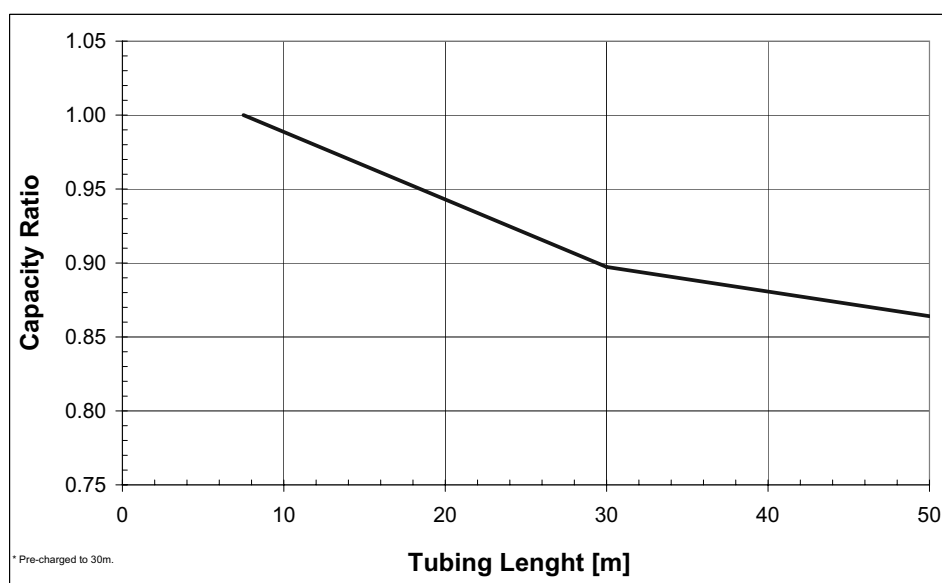
5.5.6 Pressure Curves (Heating – Test Mode)



### 5.5.7 Capacity Correction Factor Due to Tubing Length Cooling



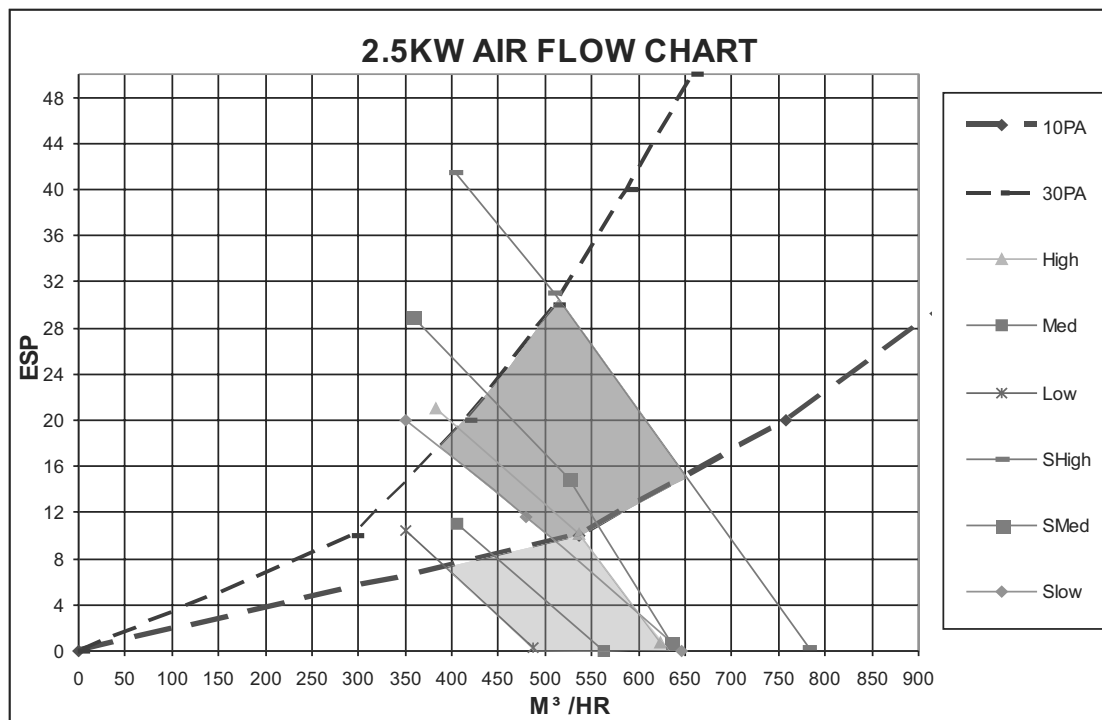
### Heating



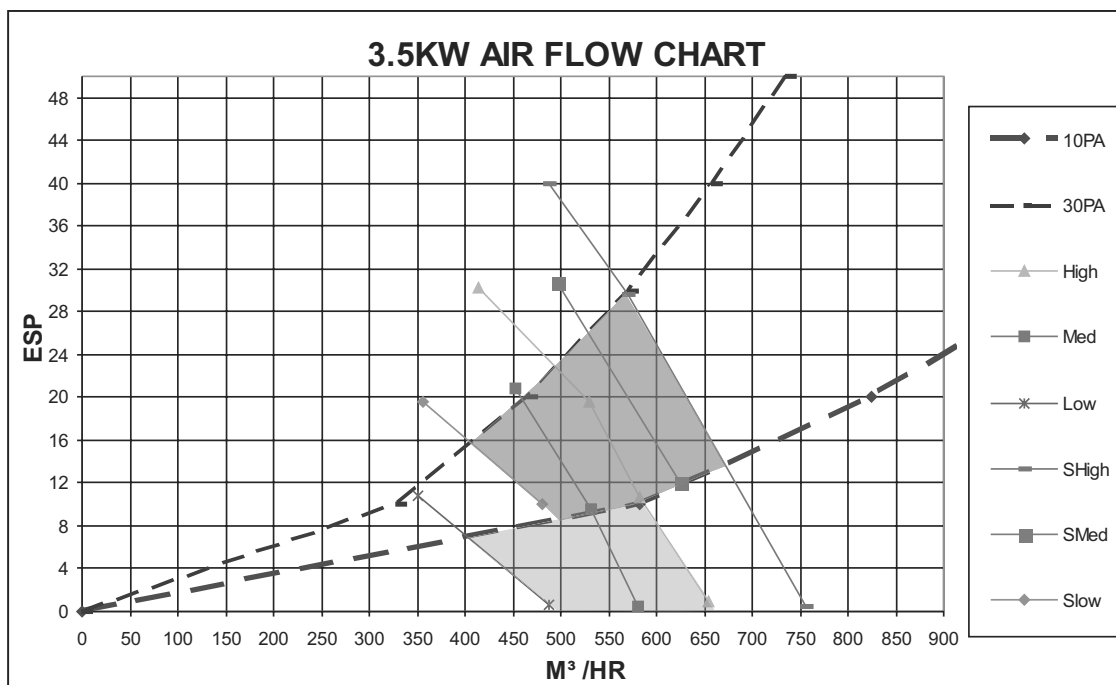


## 6. AIRFLOW CURVES

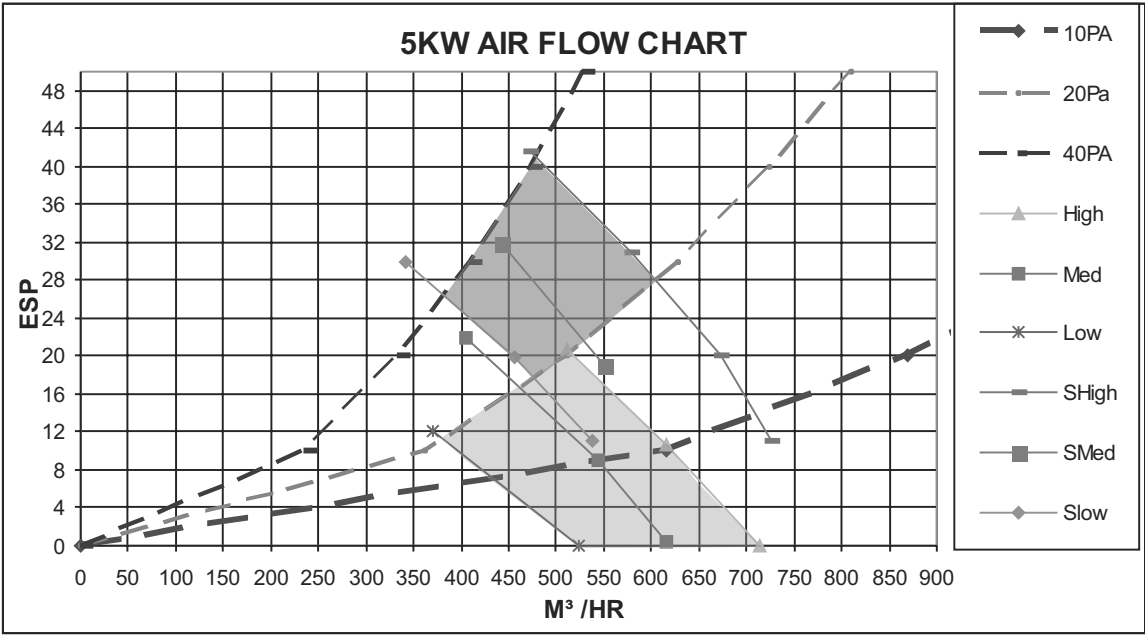
### 6.1 Model: DLF 25 DCI



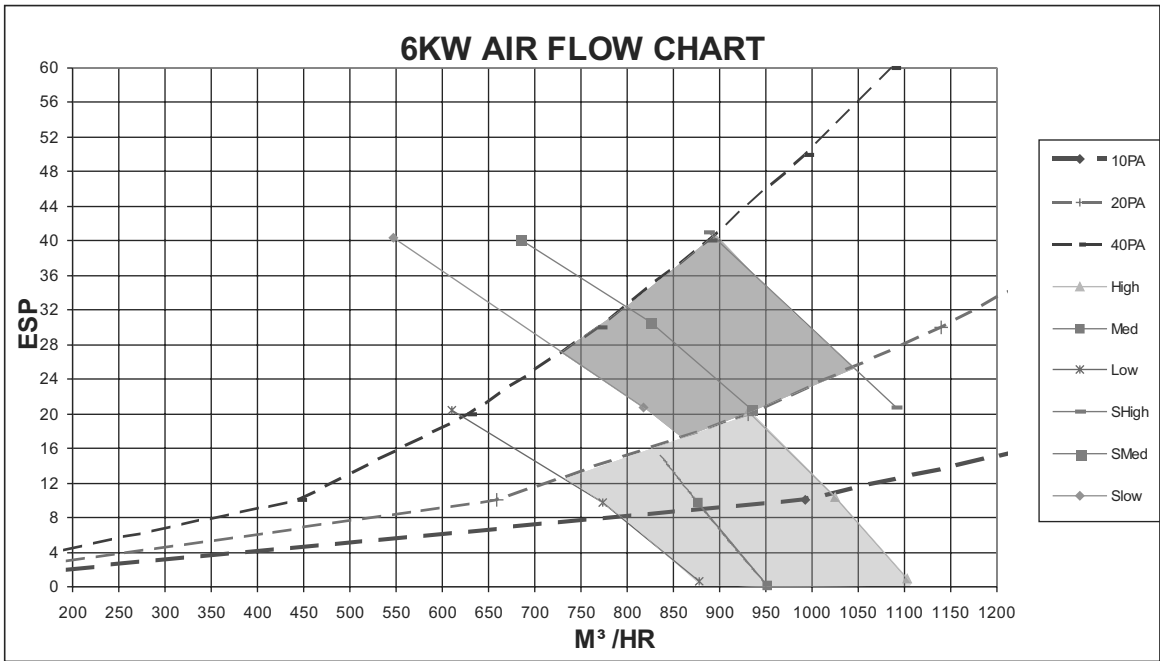
### 6.2 Model: DLF 35 DCI



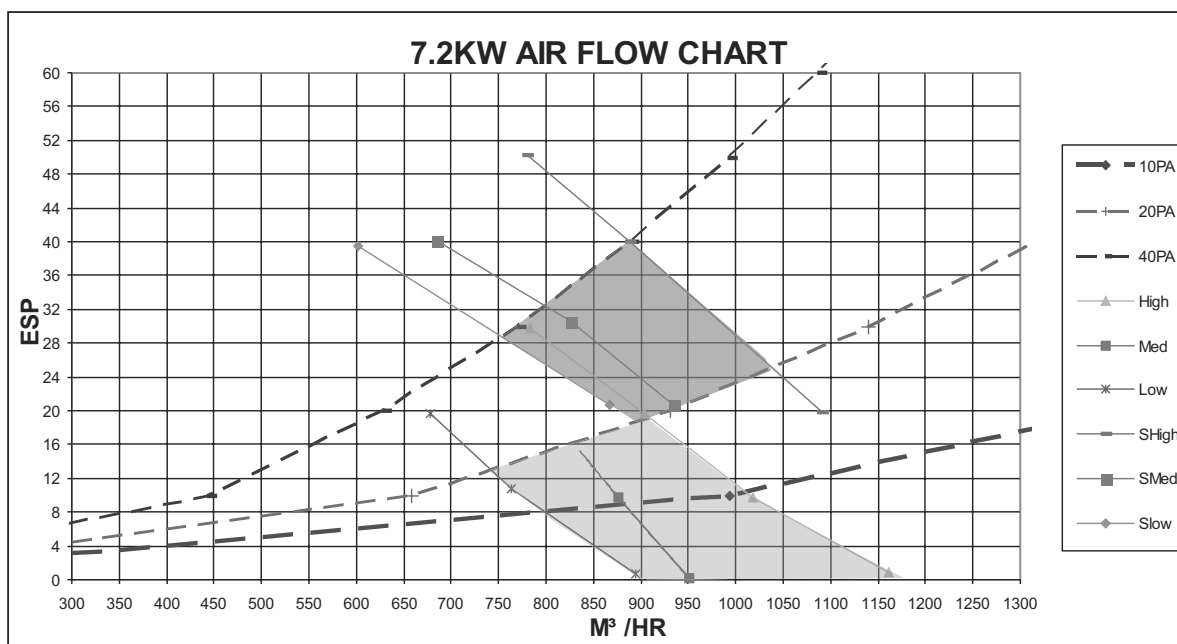
6.3 Model: DLF 50 DCI



6.4 Model: DLF 60 DCI



## 6.5 Model: DLF 72 DCI



## 6.6 DLF UNITS RANGE AIR FLOW CORRECTION FACTORS

(at nominal rating conditions — Test mode).

		Air Flow Rate [% of nominal]				
		60%	70%	80%	90%	100%
Cooling	TC	0.88	0.91	0.94	0.97	1
	SC	0.78	0.84	0.89	0.95	1
	PI	0.95	0.97	0.98	0.99	1
Heating	PI	1.07	1.05	1.03	1.02	1
	TC	0.90	0.92	0.95	0.97	1

\* Permissible Air flow Rate - according to model Air Flow Curves

## 7. SOUND LEVEL CHARACTERISTICS

### 7.1 Sound Pressure Level

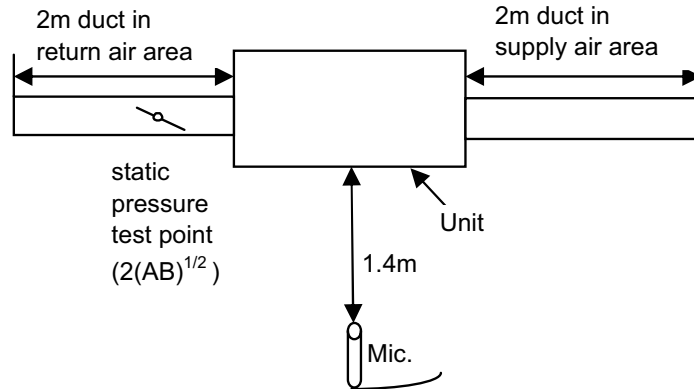
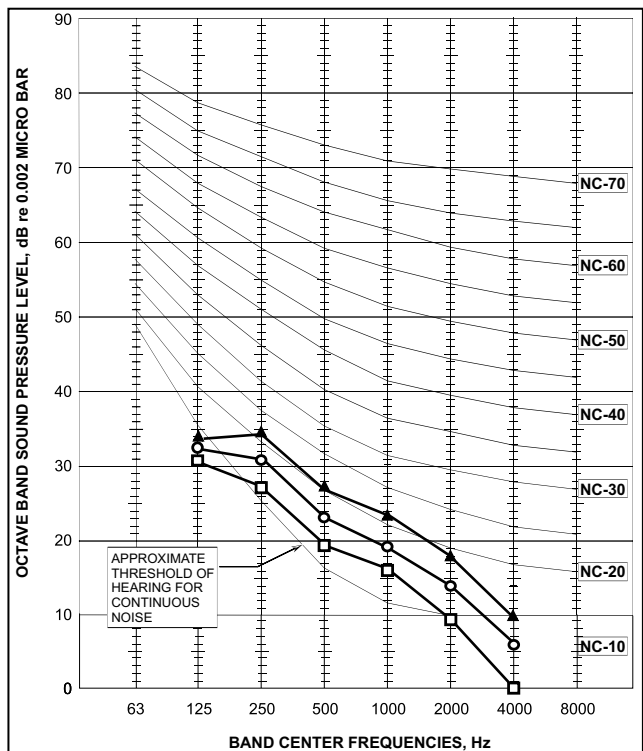
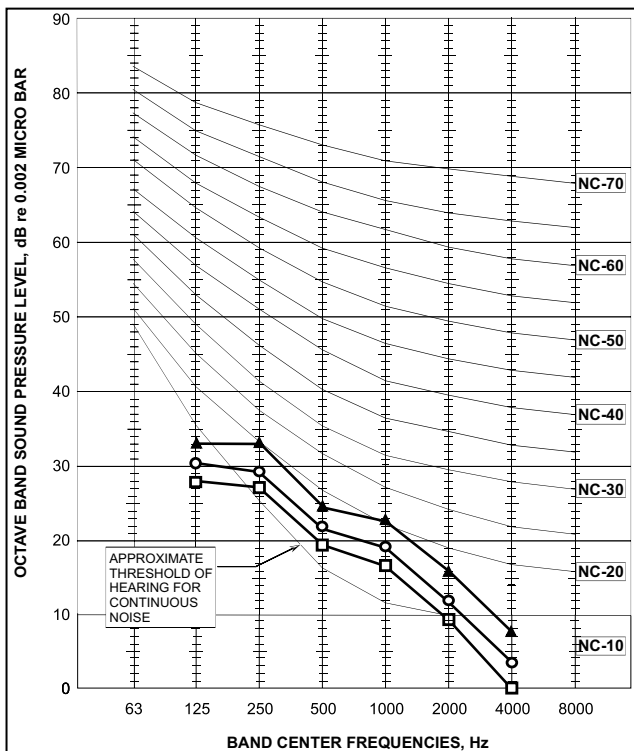


Figure 1

### 7.2 Sound Pressure Level Spectrum (Measured as Figure 1)

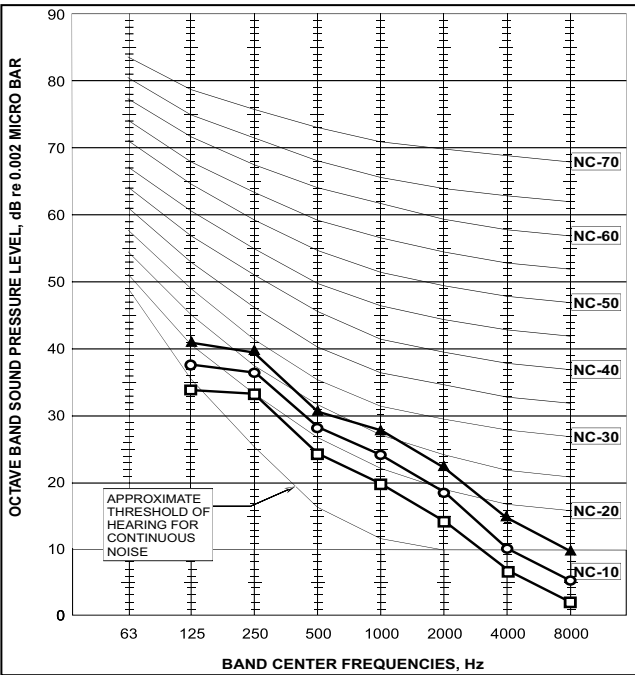
DLF 25

DLF 35

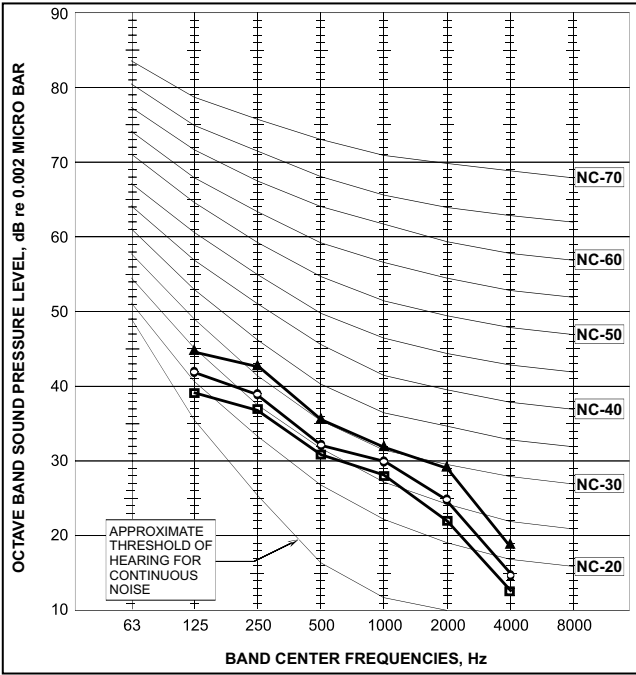


FAN SPEED	LINE
HI	—▲—
ME	—○—
LO	—□—

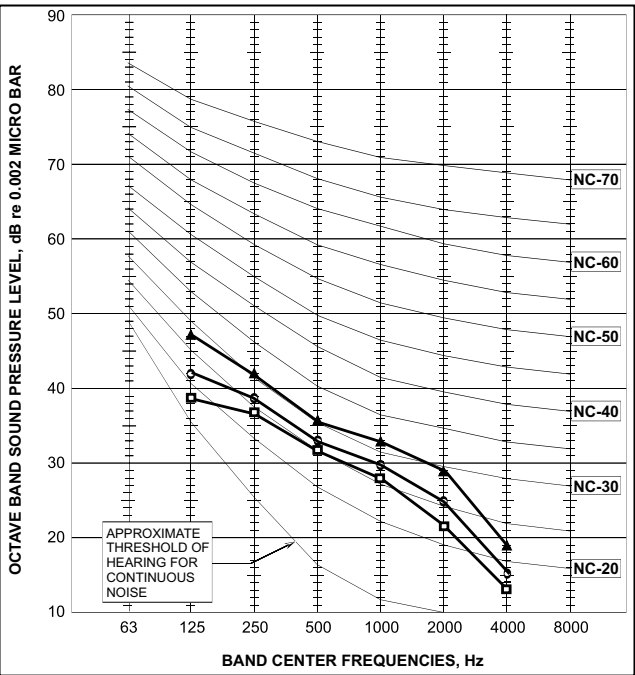
DLF 50



DLF 60



DLF 72



FAN SPEED	LINE
HI	—▲—
ME	—○—
LO	—□—

## 7.3 Outdoor units

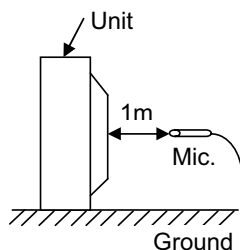
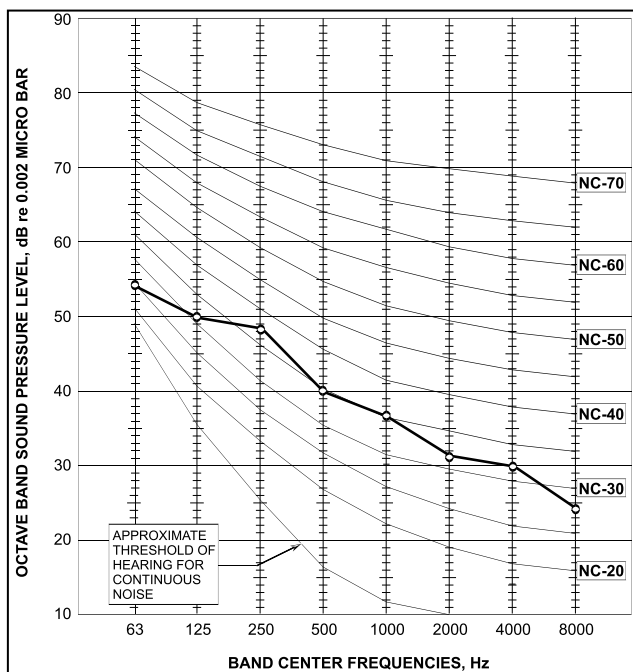


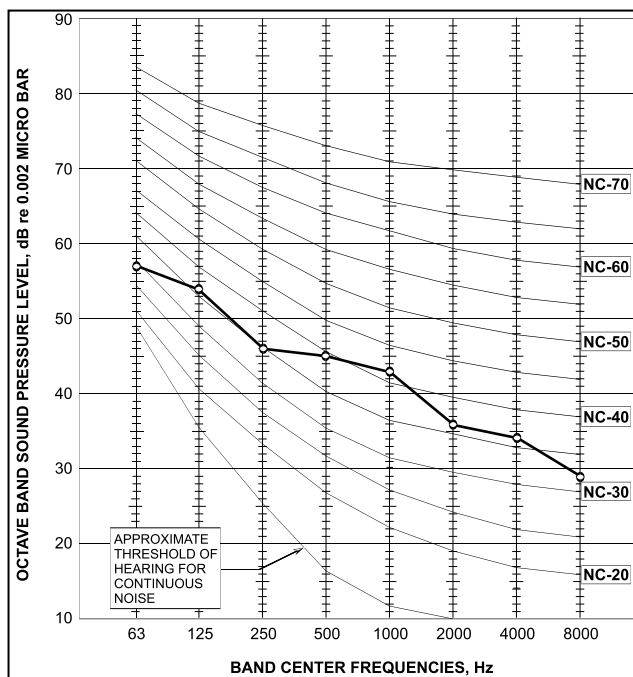
Figure 2

## 7.4 Sound Pressure Level Spectrum (Measured as Figure 2)

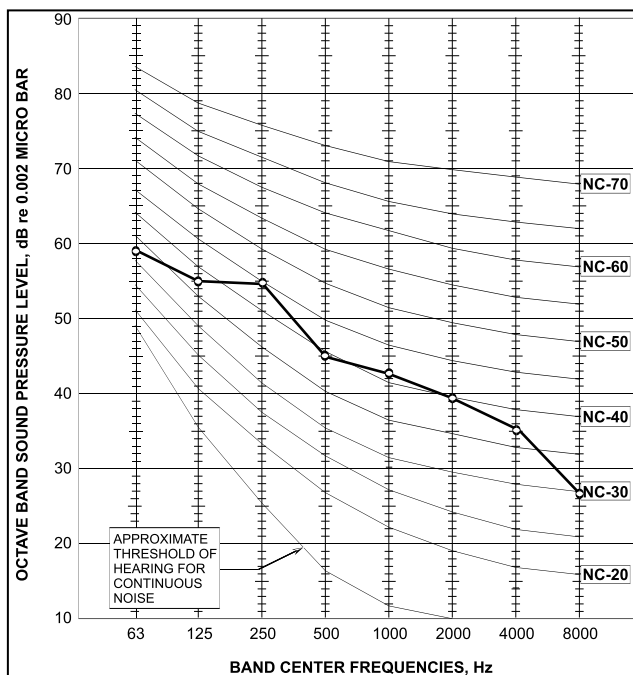
DCI 25 Cooling



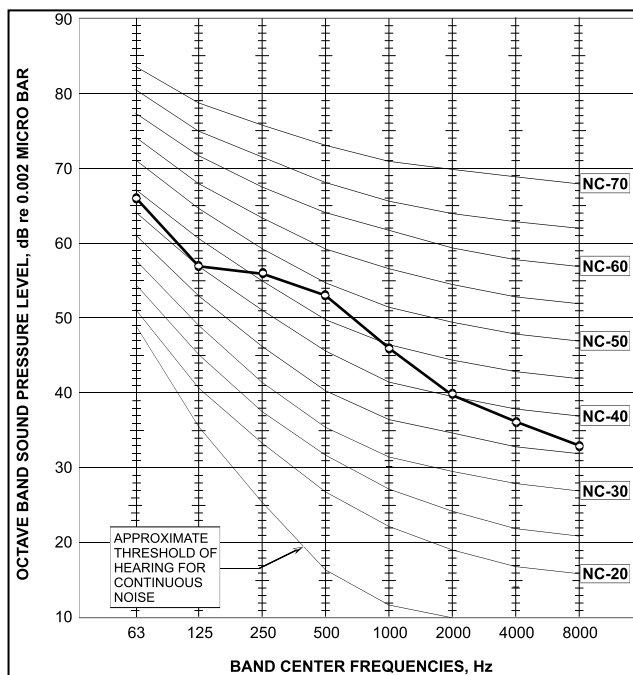
DCI 25 Heating



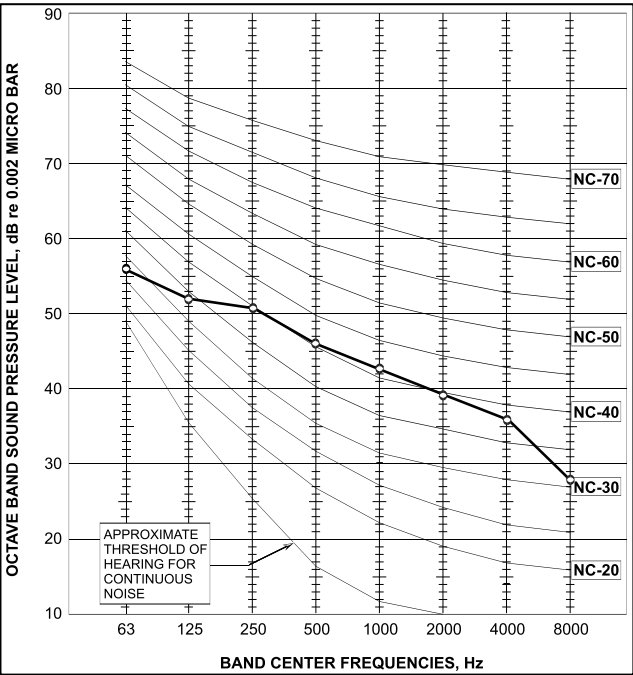
DCI 35 Cooling



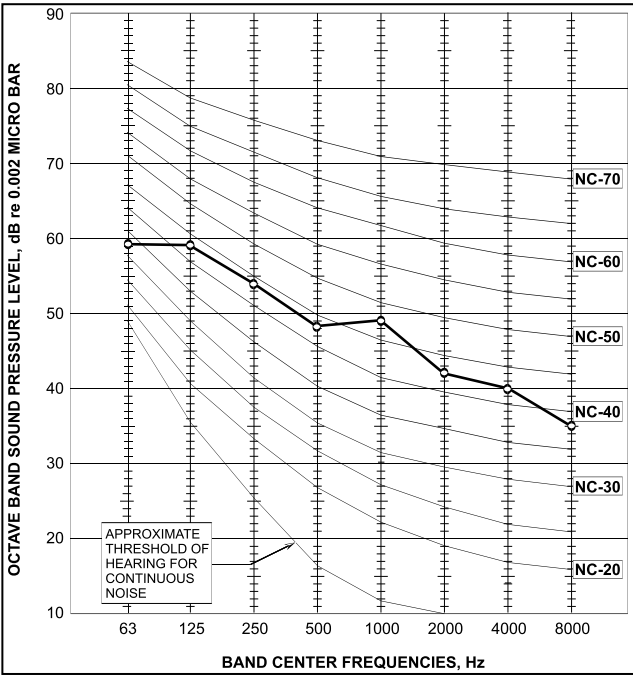
DCI 35 Heating



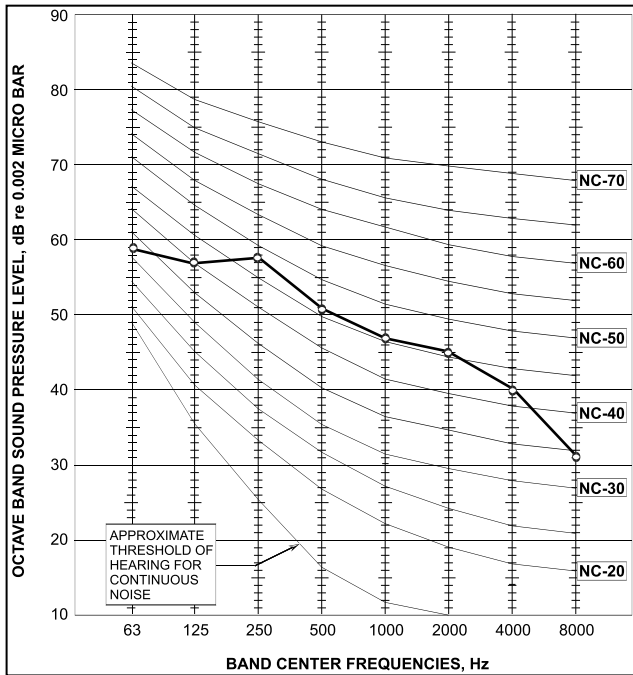
DCI 50 Cooling



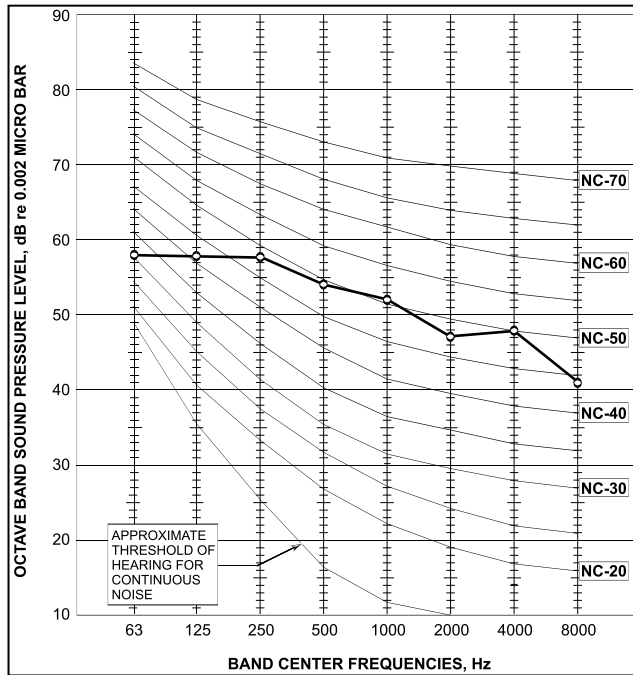
DCI 50 Heating



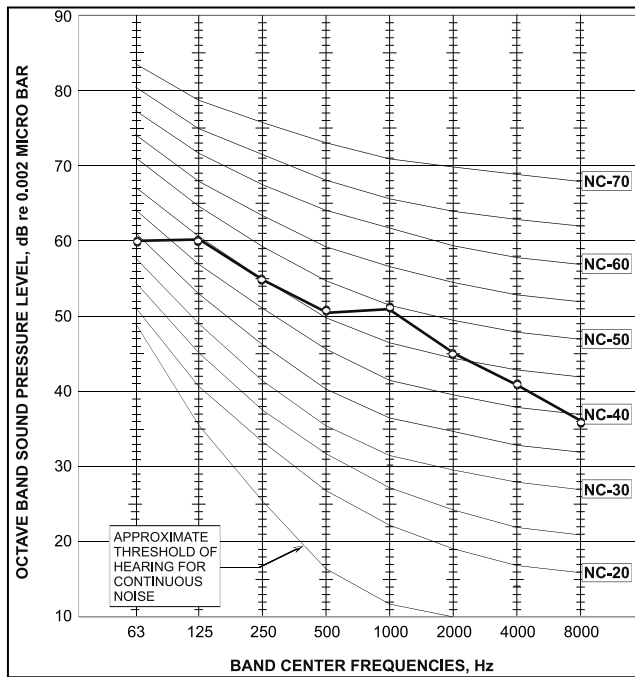
DCI 60 Cooling



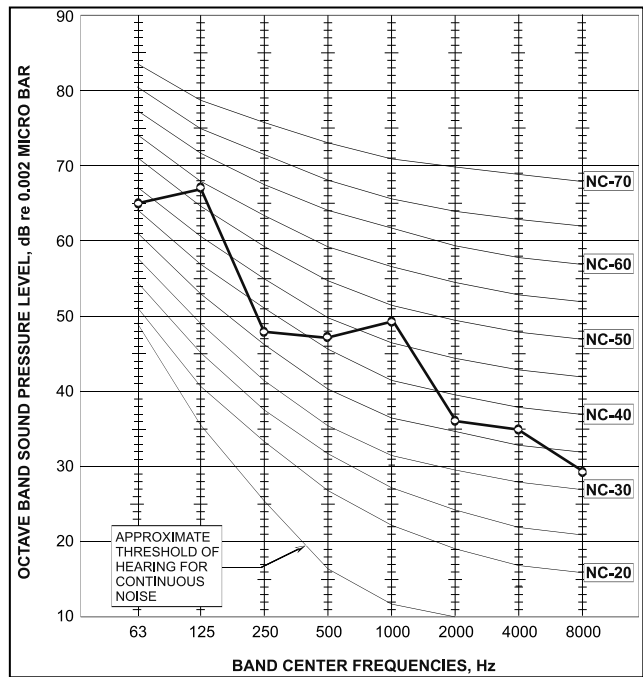
DCI 60 Heating



**DCI 72Z Cooling**



**DCI 72Z Heating**





## 8. ELECTRICAL DATA

### 8.1 Single Phase Units

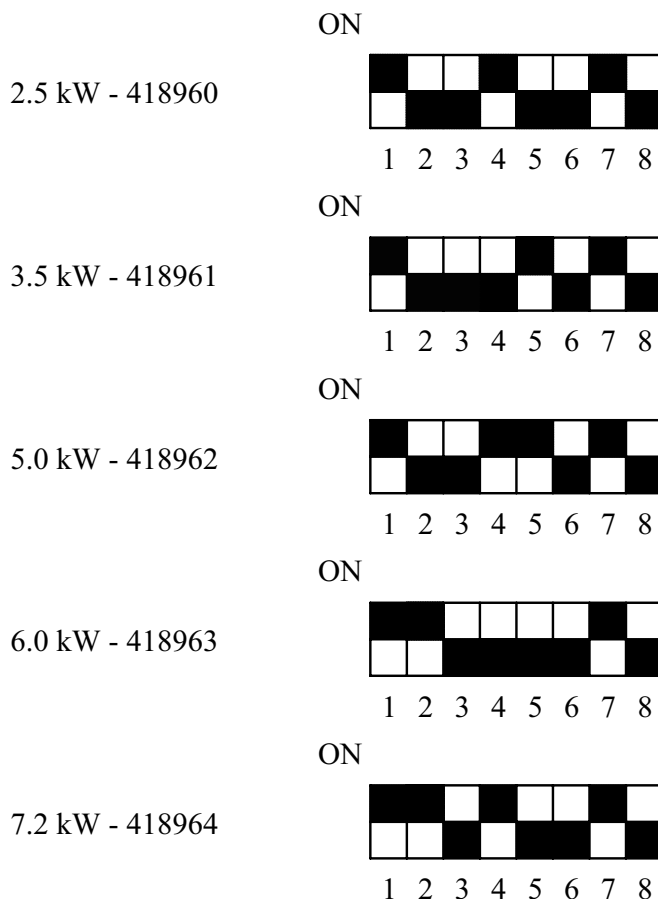
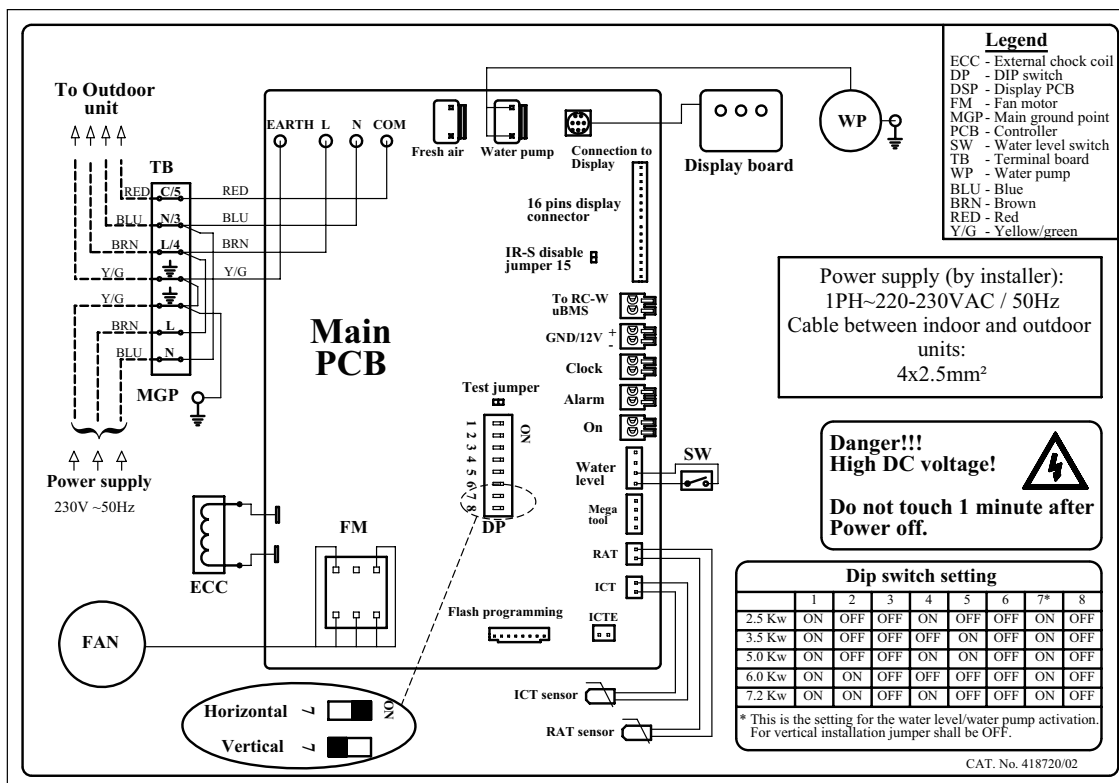
MODEL	DLF 25-35	DLF 50-60	DLF 72
Power Supply	To Indoor	To Indoor or Outdoor	To Outdoor
	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz
Max Current, A	10.5	15	15
Circuit Breaker	16	20	20
Power Supply Wiring No. X Cross Section mm <sup>2</sup>	3 X 1.5 mm <sup>2</sup>	3 X 2.5 mm <sup>2</sup>	3 X 2.5 mm <sup>2</sup>
Interconnecting Cable RC Model No. X Cross Section mm <sup>2</sup>	4 X 1.5 mm <sup>2</sup>	4 X 2.5 mm <sup>2</sup>	4 X 2.5 mm <sup>2</sup>

**NOTE:**

Power wiring cord should comply with local laws and electrical regulations requirements.

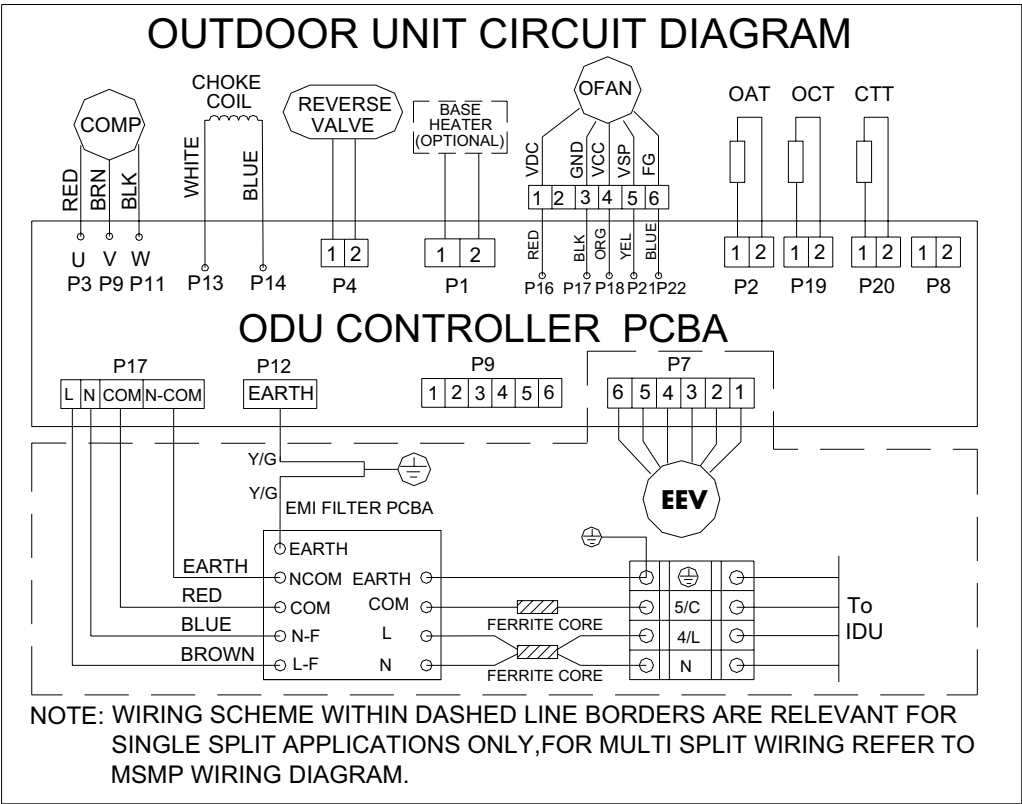
## 9. WIRING DIAGRAMS

### 9.1 Indoor Unit: DLF 25, 35, 50, 60, 72 DCI

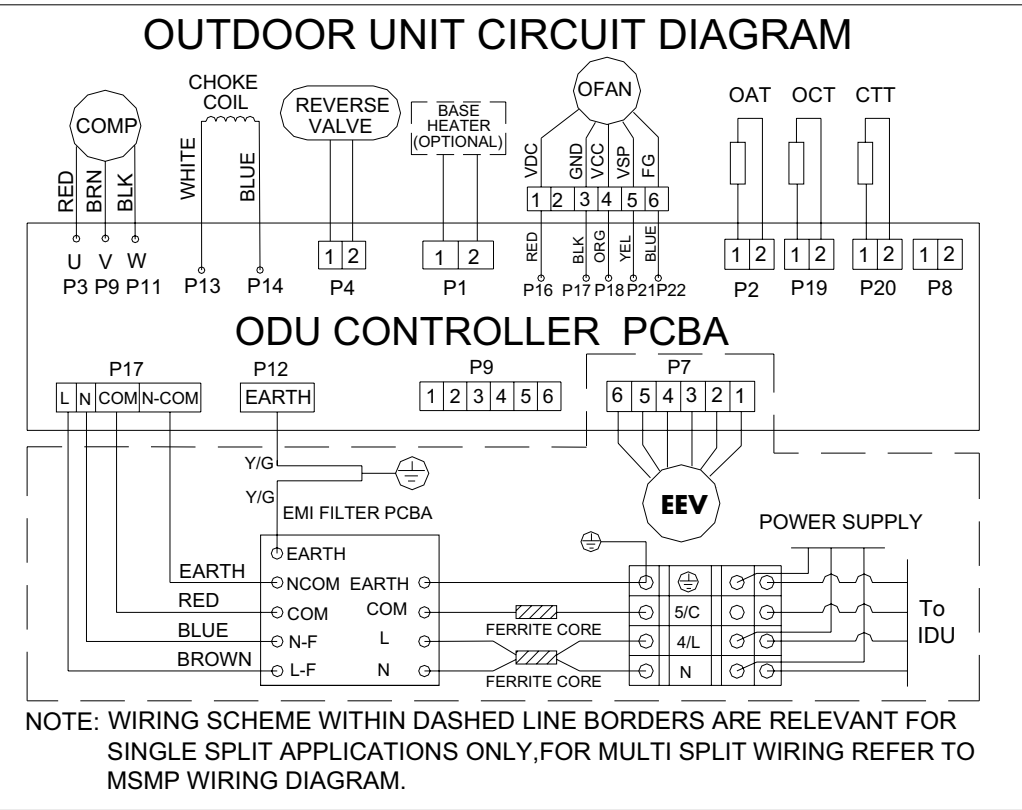


9.2 Outdoor Unit: DCI 50/60

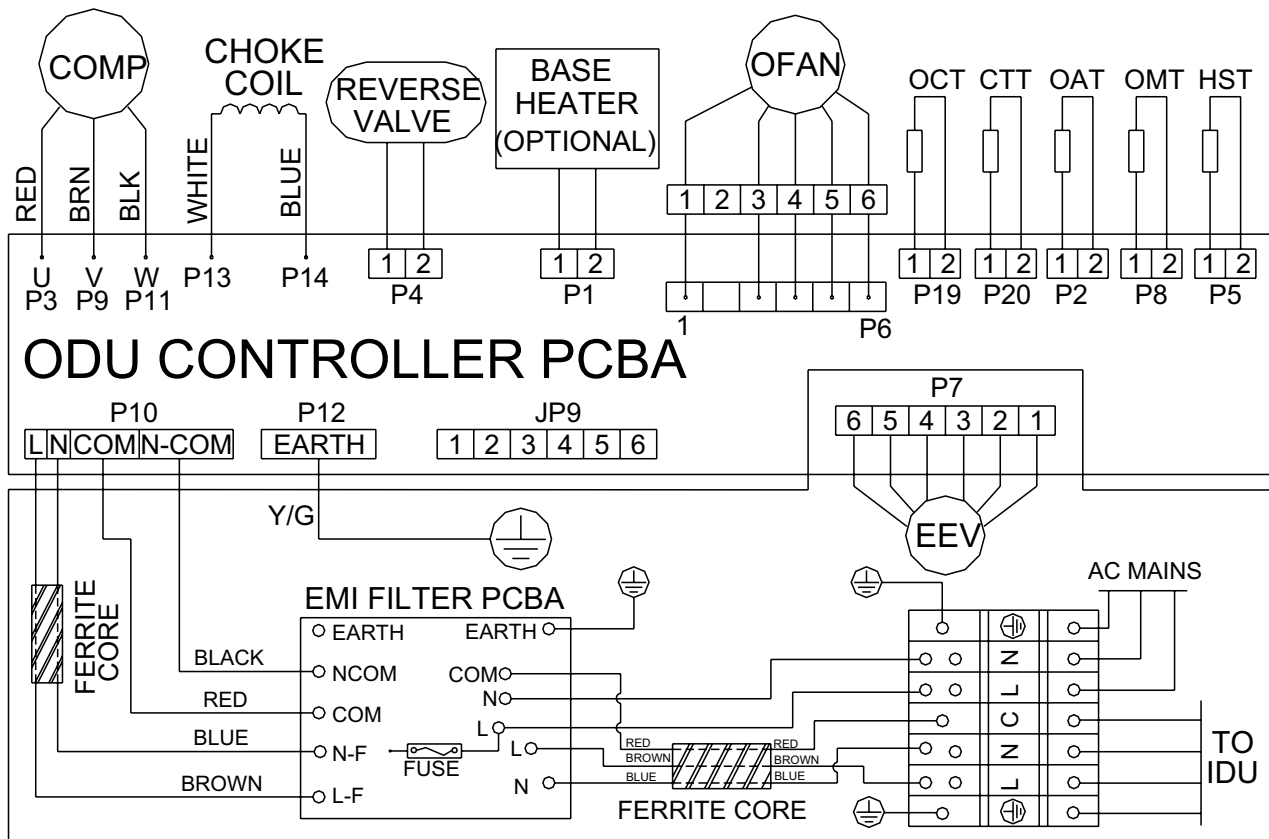
9.2.1 DCI 50/60 for Indoor Power Supply



9.2.2 DCI 50/60 for Outdoor Power Supply



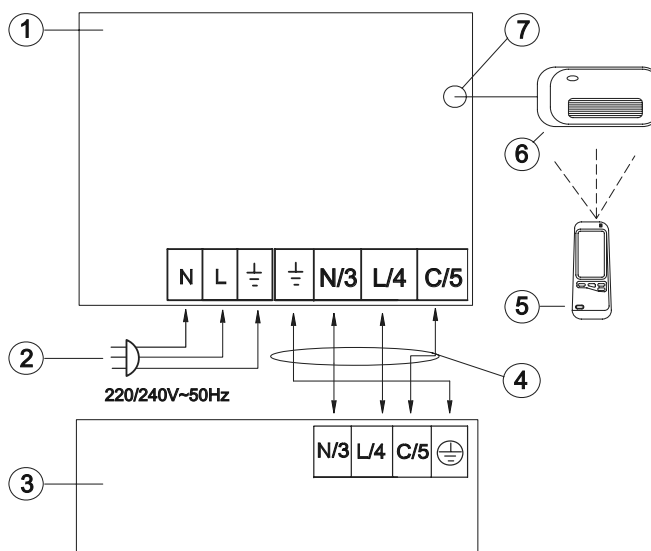
### 9.2.3 Outdoor Unit: DCI 72Z



## 10. ELECTRICAL CONNECTIONS

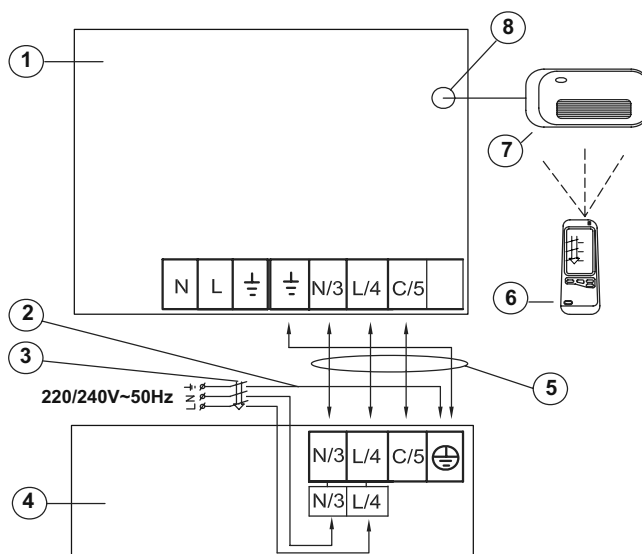
### 10.1 DLF 25, 35, 50 1PH

1. Indoor Unit
2. Power Supply Cable
3. Outdoor Unit
4. Interconnecting Cable:  
2.5-3.5KW (4x1.5mm<sup>2</sup>)  
5.0-6.0KW (4x2.5mm<sup>2</sup>)
5. Wireless Remote Control
6. Display Unit
7. Display Connector



### 10.2 DLF 60, 72 1PH

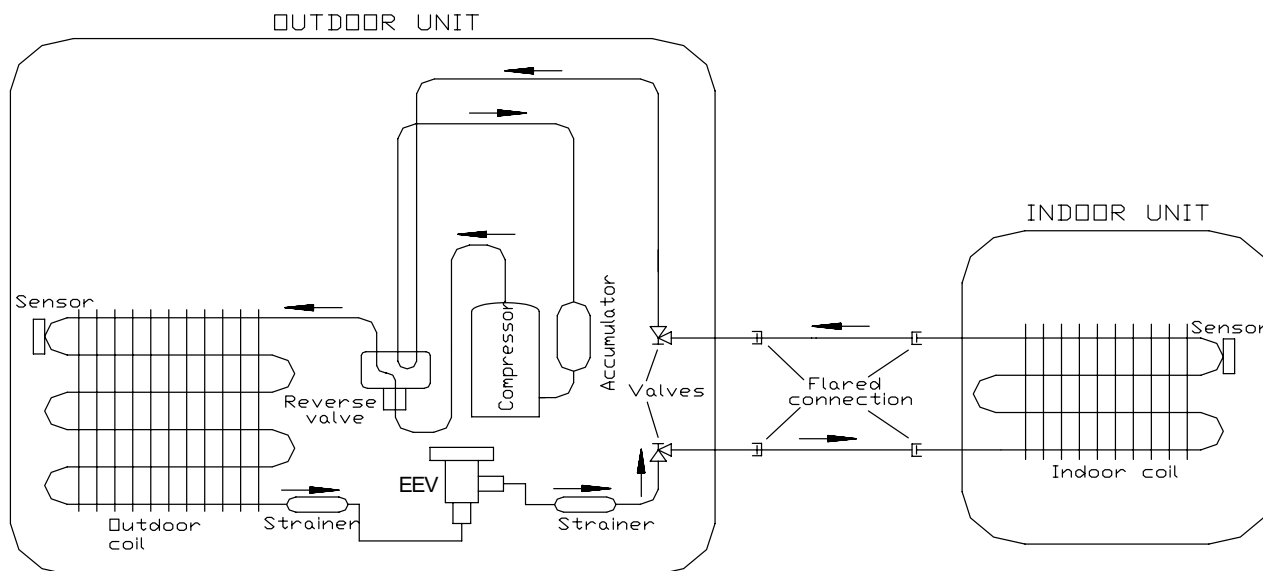
1. Indoor Unit
2. Power Supply Cable
3. Power breaker (by installer)
4. Outdoor Unit
5. Interconnecting Cable (4x2.5mm<sup>2</sup>)
6. Wireless Remote Control
7. Display Unit
8. Display Connector



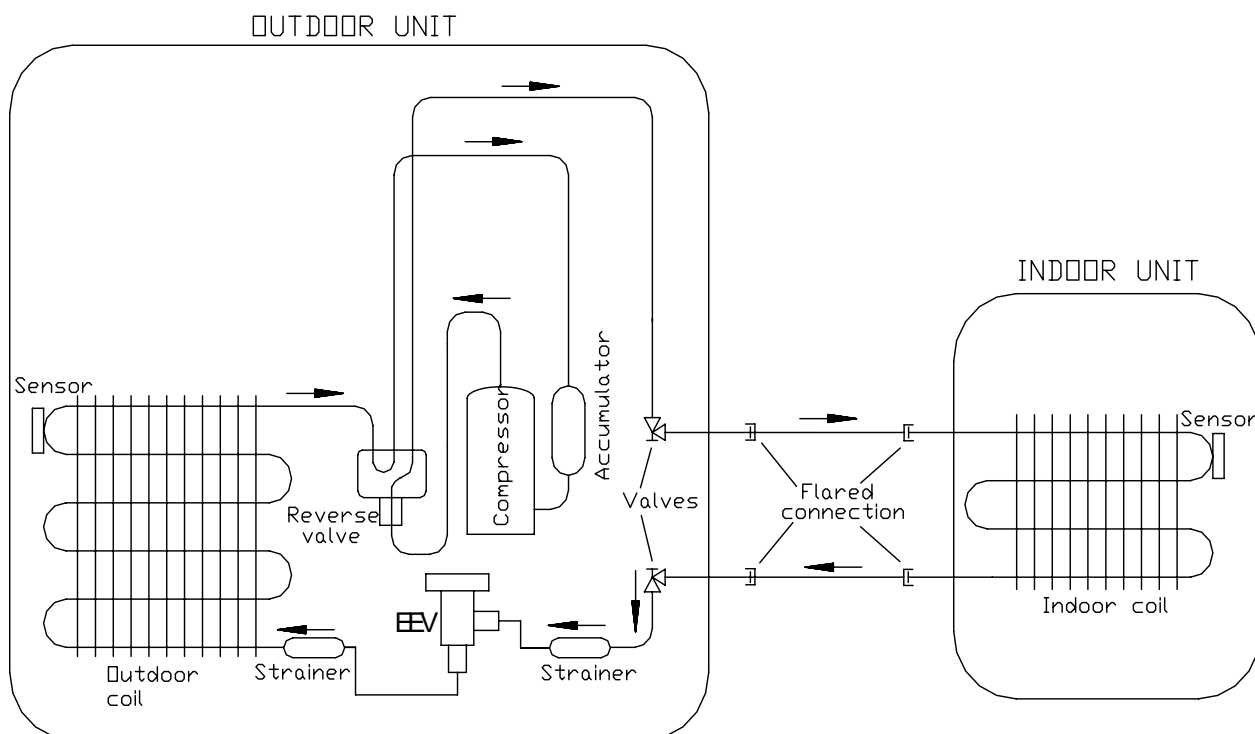
# 11. REFRIGERATION DIAGRAMS

## 11.1 DLF 25 / 35 / 50 / 60 / 72 DCI

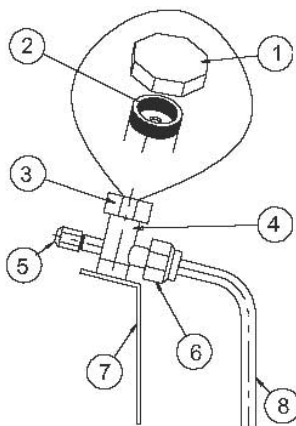
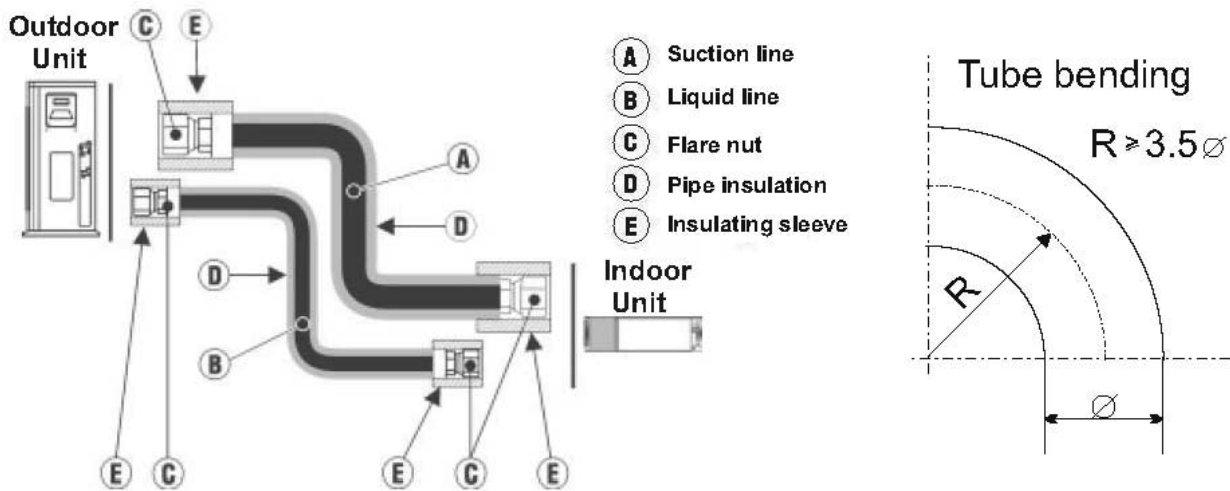
### Cooling Mode



### Heating Mode



## 12. TUBING CONNECTIONS



TUBE (Inch)	1/4"	3/8"	1/2"	5/8"	3/4"
TORQUE (Nm)					
Flare Nuts	15-18	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

1. Valve Protection Cap-end
2. Refrigerant Valve Port (use Allen wrench to open/close)
3. Valve Protection Cap
4. Refrigerant Valve
5. Service Port Cap
6. Flare Nut
7. Unit Back Side
8. Copper Tube

## 13. CONTROL SYSTEM

### 13.1 General Functions and Operating Rules The DCI software is fully parametric.

All the model dependent parameters are shown in Blue color and with Italic style [*parameter*].

The parameters values are given in the last section of this control logic chapter of the service manual.

#### 13.1.1 System Operation Concept

The control function is divided between indoor and outdoor unit controllers. Indoor unit is the system 'Master', requesting the outdoor unit for cooling/heating capacity supply. The outdoor unit is the system 'Slave' and it must supply the required capacity unless it enters into a protection mode avoiding it from supplying the requested capacity.

The capacity request is transferred via indoor to outdoor communication, and is represented by a parameter called 'NLOAD'. NLOAD is an integer number with values between 0 and 127, and it represents the heat or cool load felt by the indoor unit.

#### 13.1.2 Compressor Frequency Control

##### 13.1.2.1 NLOAD setting

The NLOAD setting is done by the indoor unit controller, based on a PI control scheme.

The actual NLOAD to be sent to the outdoor unit controller is based on the preliminary LOAD calculation, the indoor fan speed, and the power shedding function.

NLOAD limits as a function of indoor fan speed:

Indoor Fan Speed Maximum NLOAD Cooling Maximum NLOAD Heating

Indoor Fan Speed	Maximum NLOAD Cooling	Maximum NLOAD Heating
Low	<i>MaxNLOADIF1C</i>	<i>MaxNLOADIF1H</i>
Medium	<i>MaxNLOADIF2C</i>	<i>MaxNLOADIF2H</i>
High	<i>MaxNLOADIF3C</i>	<i>MaxNLOADIF3H</i>
Turbo	<i>MaxNLOADIF4C</i>	<i>MaxNLOADIF4H</i>
Auto	<i>MaxNLOADIF5C</i>	<i>MaxNLOADIF5H</i>

NLOAD limits as a function of power shedding:

Mode	Power Shedding OFF	Power Shedding ON
Cooling	No limit	Nominal Cooling
Heating	No limit	Nominal heating

#### 13.1.3 Target Frequency Setting

##### 13.1.3.1 Target Frequency Setting for DCI 25/35/50/60/72Z

The compressor target frequency is a function of the NLOAD number sent from the indoor controller and the outdoor air temperature.

Basic Target Frequency Setting:

Up to **SW 35V12**

NLOAD	Target Frequency [Hz]
<10	0
10	<i>MinFreqC</i> in cool OR <i>MinFreqH</i> in heat mode
11-126	NLOAD (as long it is in the allowed range, if not, the <i>MinFreqC</i> or <i>MaxFreqC</i> in cool mode OR <i>MinFreqH</i> or <i>MaxFreqH</i> in heat mode will be selected).
127	<i>MaxFreqC</i> in cool OR <i>MaxFreqH</i> in heat mode.



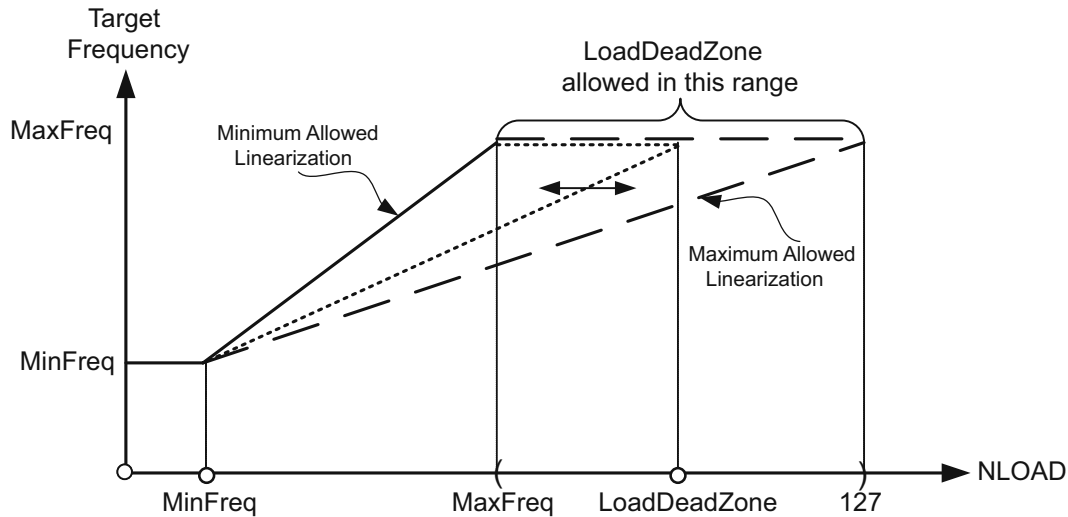
**SW 35V14 and above**

NLOAD	Target Frequency [Hz]
0	0
$0 < \text{NLOAD} \leq \text{MinFreq}$	<i>MinFreq</i>
$> \text{MinFreq}$	$\frac{\text{MaxFreq} - \text{MinFreq}}{\text{LoadDeadZone} - \text{MinFreq}} \cdot \{\min(\text{NLOAD}, \text{LoadDeadZone}) - \text{MinFreq}\} + \text{MinFreq}$

**Differences between Old and New ODU DCI/DCR software**

Unit	Current software	New software
DCI	35V12	35V14

**Comment:** there is no use for **35V13** software. This software is used in the past for Nordic countries. However, currently it's stopped completely from being used.

**Graphical Illustration:**

	Mode	During initial period (Start Phase)	After initial period (Run Phase)
MaxFreq	Cool	<i>MaxFreqC</i>	<i>MaxFreqCRunPhase</i>
	Heat	<i>MaxFreqH</i>	<i>MaxFreqHRunPhase</i>
MinFreq	Cool	<i>MinFreqC</i>	
	Heat	<i>MinFreqH</i>	
LoadDeadZone	Cool	<i>LoadDeadZoneC</i>	
	Heat	<i>LoadDeadZoneH</i>	

#	Name	A Single DCI-25	B Single DCI-35	C Single DCI-50	D Single DCI 60	E Duo 50	F DCR 50	G Duo Delta38	H Trio Delta52	I DCR 50T
1	<i>MinFreqC</i>	30	33	20	20	20	20	38	20	20
2	<i>MaxFreqC</i>	64	80	85	95	97	77	93	100	77
3	<i>MaxFreqCRunPhase</i>	64	80	85	95	97	77	85	95	77
4	<i>MinFreqH</i>	30	35	20	26	26	26	38	25	26
5	<i>MaxFreqH</i>	81	93	95	94	106	79	100	100	79
6	<i>MaxFreqHRunPhase</i>	81	93	95	94	106	79	90	95	79
7	<i>LoadDeadZoneC</i>	90	95	95	111	97	90	93	127	90
8	<i>LoadDeadZoneH</i>	127	127	127	127	106	127	100	100	127

Target frequency limits as a function of outdoor air temperature (OAT):

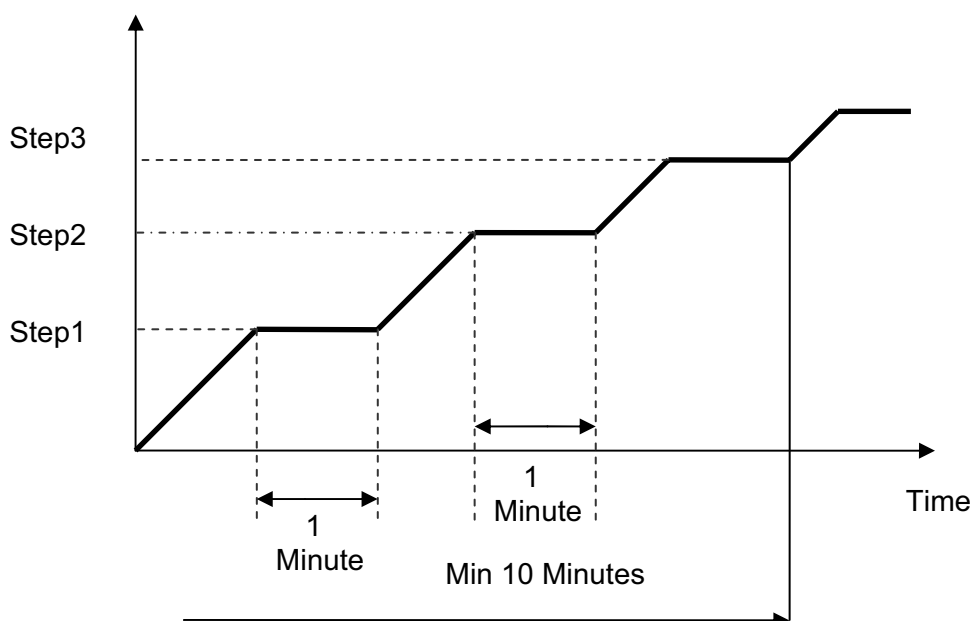
OAT Range	Cooling Mode limits	Heating Mode limits
OAT < 6	<i>MaxFreqAsOATC</i>	No limit
$6 \leq \text{OAT} < 15$		<i>MaxFreqAsOAT1H</i>
$15 \leq \text{OAT} < 28$		<i>MaxFreqAsOAT2H</i>
$28 \leq \text{OAT}$	No limit	

### 13.1.4 Frequency Changes Control

When the unit is running normally , the compressor frequency change rate is 1 Hz/sec.

### 13.1.5 Compressor Starting Control

#### 13.1.5.1 Compressor starting control for DCI25/35/50/60



#### 13.1.5.2 Compressor starting control for DCI72Z

##### Step 1

Whenever the compressor starts up, after it has been off for more than 45 minutes, the compressor frequency cannot go below *Step1RPS* for 3 continuous minutes (*this rule comes to ensure oil return to the compressor*).

##### Step 2

The compressor speed cannot go above *Step2RPS* once after each compressor start up for 3 continuous minutes (*this rule comes to prevent oil exit from the compressor after its start up*).

##### Step 3

The speed cannot go higher than *Step3RPS* unless it was operating for more than 1 continuous minutes between *Step3RPS – 5* and *Step3RPS*.

After passing above *Step3RPS*, this rule is re-applied when passing below *Step3RPS-5*.

**13.1.6 Minimum On and Off Time**

3 minutes

**13.1.7 Indoor Fan Control**

8 Indoor fan speeds are determined for each model. 4 speeds for cool/dry/fan modes and 4 speeds for heat mode.

When user sets the indoor fan speed to a fixed speed (Low/ Medium/ High), unit will operate constantly at set speed.

When Auto Fan is selected, indoor unit controller can operate in all speeds. The actual speed is set according to the cool/heat load.

**13.1.7.1 Turbo Speed**

The Turbo speed is activated during the first 30 minutes of unit operation when auto fan speed is selected and under the following conditions:

Difference between set point and actual room temperature is bigger than 3 degrees.

Room temperature > 22 for cooling, or < 25 for heating.

**13.1.8 Outdoor Fan Control****13.1.8.1 Outdoor Fan Control for DCI25/35/50/60**

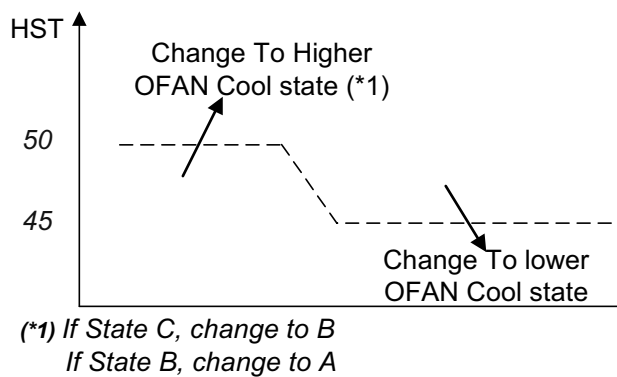
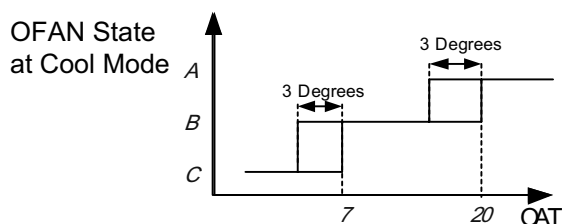
7 outdoor fan speeds are determined for each model. 3 speeds for cool and dry modes, and 3 speeds for heat mode, and a very low speed.

Outdoor fan speed is a function of compressor frequency and outdoor air temperature (OAT).

4 routines for fan control are determined. The control routine selection depends on operation mode, compressor speed, outdoor air temperature (OAT) and heat sink temperature (HST).

Routine	Conditions
<b>A</b>	Heating with OAT < 15°C or Cooling with OAT > 20°C, or Faulty OAT
<b>B</b>	Cooling with 20°C > OAT > 7°C
<b>C</b>	Cooling with 7°C > OAT
<b>D</b>	Heating with OAT > 15°C

	OFAN Speed			
Compressor Target Frequency	Routin A	Routin B	Routin C	Routin D
Freq=0	OFF	OFF	OFF	OFF
$10 \leq \text{Freq} < \text{OFLowFreq}$	Low	Low	VL	Low
$\text{OFLowFreq} \leq \text{Freq} < \text{OFMedFreq}$	Medium	Low	VL	Low
$\text{OFMedFreq} \leq \text{Freq}$	High	Low	Low	Medium



When compressor is switched to OFF and the heat sink temperature is above 55 degrees, the outdoor fan will remain ON in low speed for up to 3 minutes.

### 13.1.8.2 Outdoor Fan Control for DCI72Z

OFAN operates between *OFMinRPM* to *OFMaxRPM*.

Min time for speed change of OFAN *OFMinTimeReduce* (60 seconds).

There are 4 defined speeds – High, Med, Low, and Very Low.

The actual OFAN speeds in cool mode are defined according to the following table:

Freq	Outdoor air temperature (OAT)											
	-10	-5	0	5	10	15	20	25	30	35	40	46
0	0	0	0	0	0	0	0	0	0	0	0	0
15	80	100	120	130	220	340	460	580	600	730	730	730
25	130	140	160	190	250	380	600	610	670	730	740	750
35	160	180	210	250	330	470	730	730	730	730	780	800
45	205	230	260	320	440	600	730	730	730	730	800	850
55	250	280	310	390	550	730	730	730	730	730	800	850
65	275	315	355	470	640	730	730	730	730	730	800	850
75	300	350	400	550	730	730	730	730	730	730	800	850
85	325	395	445	630	730	730	730	730	730	730	800	850
95	350	440	490	710	730	730	730	730	730	730	800	850

The actual OFAN speeds in heat mode are defined according to the following table

Freq	Outdoor air temperature (OAT)						
	-15	-7	0	7	14	21	24
0	0	0	0	0	0	0	0
15	850	850	750	750	500	350	300
25	850	850	750	750	520	370	320
35	850	850	750	750	540	390	340
45	850	850	750	750	560	410	360
55	850	850	750	750	580	430	380
65	850	850	750	750	600	450	400
75	850	850	750	750	620	470	420
85	850	850	750	750	640	490	440
95	850	850	750	750	650	500	450

The fan speed is also related to protections and OMT value.

### 13.1.9 EEV (Electronic Expansion Valve) Control

#### 13.1.9.1 EEV Control for DCI25/35/50/60

EEV opening is defined as  $EEV = EEV_{OL} + EEV_{CV}$

$EEV_{OL}$  is the initial EEV opening as a function of the compressor frequency, operation mode, unit model and capacity.

$EEV_{CV}$  is a correction value for the EEV opening that is based on the compressor temperature.

During the first 5 minutes of compressor operation  $EEV_{CV} = 0$ .

Once the first 5 minutes are over, the correction value is calculated as follow:  $EEV_{CV}(n) = EEV_{CV}(n-1) + EEV_{CTT}$

$EEV_{CTT}$  is the correction based on the compressor temperature. A target compressor temperature is set depending on frequency and outdoor air temperature, and the actual compressor temperature is compared to the target temperature to set the required correction to the EEV opening.

#### 13.1.9.2 EEV Control for DCI72Z

The target EEV value is the sum of open loop value (OL) and a result of the accumulative correction values (CV).

$$EEV = EEV_{OL} + \sum EEV_{CV}$$

Initial EEV value is set according to compressor frequency and according to indoor and outdoor model

The corrective value is calculate every 30 sec the EEV corrective value is set to keep the discharged super heat temperature between 20° to 30° in cooling and 12° to 20° in heating.

### 13.1.10 RV(Reversing Valve) Control

Reversing valve is on in heat mode.

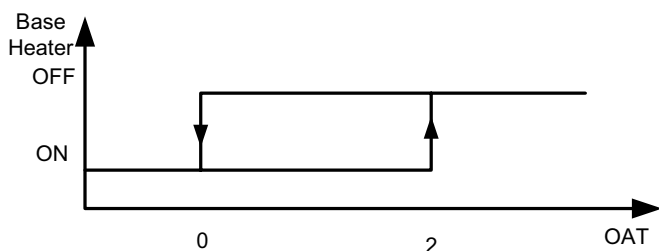
Switching of RV state is done only after compressor is off for over 3 minutes.

#### 13.1.10.1 Ioniser Control

Ioniser is on when unit is on ,AND indoor fan is on ,AND Ioniser power switch (on grille) is on.

#### 13.1.10.2 Base Heater Control

The base heater will be working only when RV is "ON" according to the following graph:



When OAT is faulty the base heater will be "ON" continuously in HEAT mode.

### 13.1.11 Fan Mode

In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.

In AutoFan user setting, fan speed will be adjusted automatically according to the difference between actual room temperature and user set point temperature.

### 13.1.12 Cool Mode

NLOAD is calculated according to the difference between actual room temperature and user set point temperature by **fuzzy** control.

In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.

In AutoFan user setting, fan speed will be adjusted automatically according to the calculated NLOAD.

### 13.1.13 Heat Mode

NLOAD is calculated according to the difference between actual room temperature and user set point temperature by **fuzzy** control.

In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.

In AutoFan user setting, fan speed will be adjusted automatically according to the calculated NLOAD.

#### 13.1.13.1 Temperature Compensation

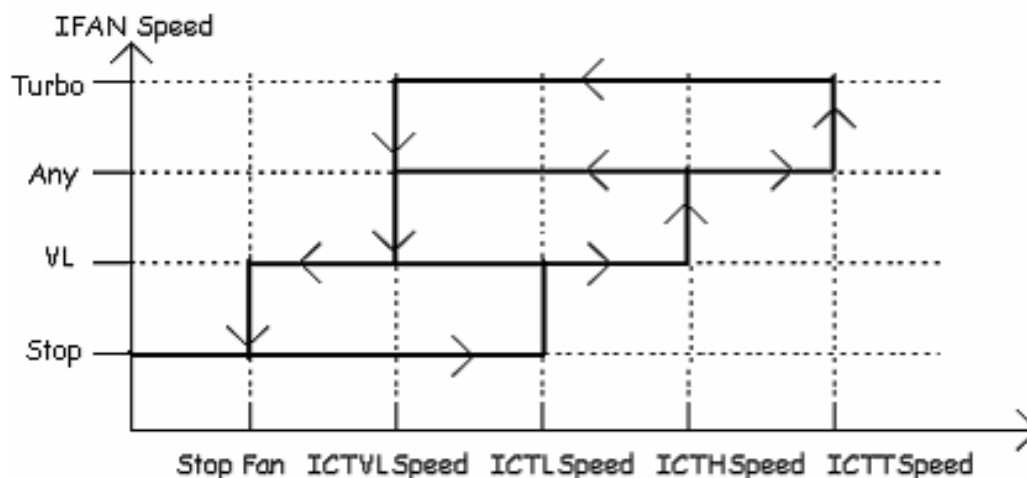
In ducted and cassette models, 3 degrees are reduced from room temperature reading (except when in I-Feel mode), to compensate for temperature difference between high and low areas in the heated room, and for coil heat radiation on room thermistor.

The temperature compensation can be enabled/disabled by shortening of J2 on the indoor unit Controller

Model	J2 Shorted	J2 Opened
Cassette	Compensation Enabled	Compensation Disabled
Ducted	Compensation Enabled	Compensation Disabled

### 13.1.13.2 Indoor Fan Control in Heating Mode

Indoor fan speed depends on the indoor coil temperature:



### 13.1.14 Auto Cool/Heat Mode

When in auto cool heat mode unit will automatically select between cool and heat mode according to the difference between actual room temperature and user set point temperature (.T).

Unit will switch from cool to heat when compressor is off for 3 minutes, and .T < -3.

Unit will switch from heat to cool when compressor is off for 5 minutes, and .T < -3.

### 13.1.15 Dry Mode

As long as room temperature is higher than the set point, indoor fan will work in low speed and compressor will work between 0 and *MaxNLOADIF1C* Hz.

When the room temperature is lower than the set point, compressor will be switched OFF and indoor fan will cycle 3 minutes OFF, 1 minute ON.

### 13.1.16 Protections

There are 5 protection codes.

Normal (Norm) – unit operate normally.

Stop Rise (SR) – compressor frequency can not be raised but does not have to be decreased.

HzDown1 (D1) – Compressor frequency is reduced by 2 to 5 Hz per minute.

HzDown2 (D2) – Compressor frequency is reduced by 5 to 10 Hz per minute.

Stop Compressor (SC) – Compressor is stopped.

#### 13.1.16.1 Indoor Coil Defrost Protection — CK

Min(ICT,ICTE)	Trend				
	Fast Increasing	Increasing	No Change	Decreasing	Fast Decreasing
< -2	SC	SC	SC	SC	SC
[-2, 0)	D1	D1	D2	D2	D2
[0, 2)	SR	SR	D1	D2	D2
[2, 4)	SR	SR	SR	D1	D2
[4, 6)	Norm	Norm	SR	SR	D1
[6, 8]	Norm	Norm	Norm	SR	SR
> 8	Norm				

### 13.1.16.2 Indoor Coil Defrost Protection — DLF

ICT	Trend				
	Fast Increasing	Increasing	No Change	Decreasing	Fast Decreasing
< -2	SC	SC	SC	SC	SC
[-2, 0)	D1	D1	D2	D2	D2
[0, 2)	SR	SR	D1	D2	D2
[2, 4)	SR	SR	SR	D1	D2
[4, 6)	Norm	Norm	SR	SR	D1
[6, 8]	Norm	Norm	Norm	SR	SR
> 8	Norm				

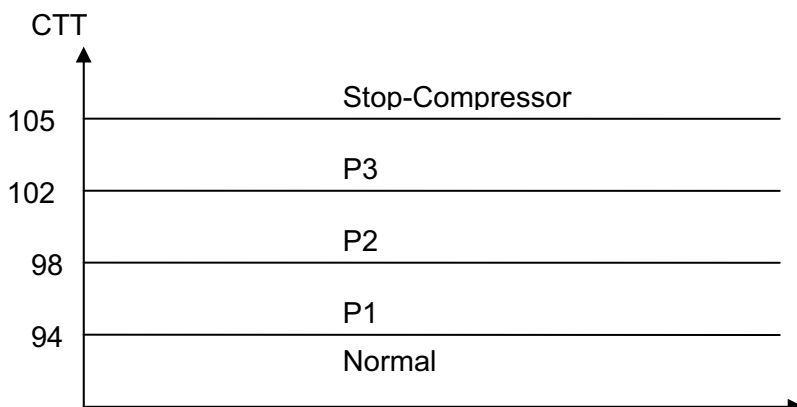
### 13.1.16.3 Indoor Coil Overheating Protection

ICT	ICT Trend				
	Fast Decreasing	Decreasing	No Change	Increasing	Fast Increasing
>62	SC	SC	SC	SC	SC
[60, 62)	D1	D1	D2	D2	D2
[55, 60)	SR	SR	D1	D2	D2
[52, 55)	SR	SR	SR	D1	D2
[48, 52)	Norm	Norm	SR	SR	D1
[45, 48)	Norm	Norm	Norm	SR	SR
I<45	Norm				

## 13.1.17 Compressor Overheating Protection

### 13.1.17.1 Compressor Overheating Protection for DCI25/35/50/60/72Z

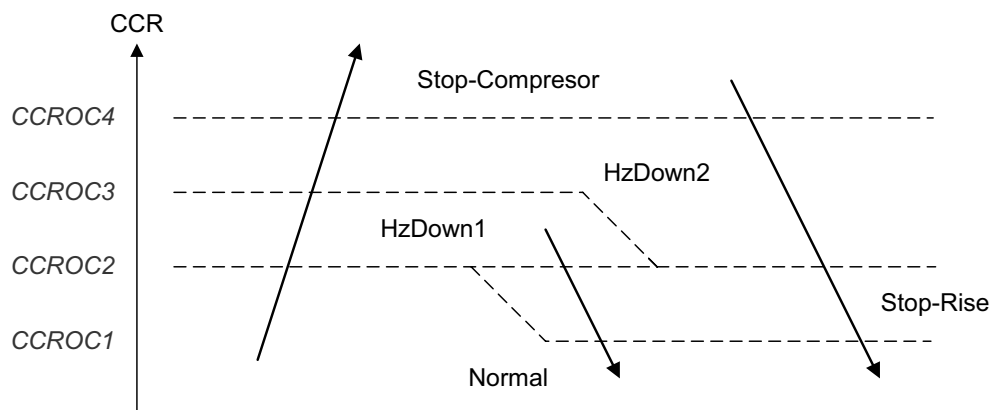
Compressor temperature can be in one of 5 control zones (4 in protection, and 1 normal), according to the following chart.



Control Status	Compressor Temperature Increases	Else
P1	Normal	Stop Rise
P2	HzDown 1	Stop Rise
P3	HzDown 2	HzDown 1
Stop Compressor	Stop Compressor	



### 13.1.17.2 Compressor Over Current Protection Only For DCI25/35/50/60/72Z



### 13.1.18 Heat Sink Overheating Protection

#### 13.1.18.1 Heat Sink Overheating Protection For DCI25/35/50/60/72Z

HST	HST Trend				
	Fast Decreasing	Decreasing	No Change	Increasing	Fast Increasing
$\geq 90$	SC	SC	SC	SC	SC
[85, 90)	D1	D1	D2	D2	D2
[82, 85)	SR	SR	D1	D2	D2
[80, 82)	SR	SR	SR	D1	D1
[78, 80)	Norm	Norm	Norm	SR	SR
$< 78$	Norm				

### 13.1.19 Outdoor Coil Deicing Protection

#### 13.1.19.1 Outdoor coil Deicing Protection For DCI25/35/50/60/72Z

- Entering Deicing Conditions

Deicing operation will start when either one of the following conditions exist:

Case 1:  $OCT < OAT - 8$  AND  $TLD > DI$

Case 2:  $OCT < OAT - 12$  AND  $TLD > 30$  minutes.

Case 3:  $OCT$  is Invalid AND  $TLD > DI$

Case 4: Unit is just switched to STBY AND  $OCT < OAT - 8$

Case 5:  $NLOAD = 0$  AND  $OCT < OAT - 8$

Case 6:  $OCT < -19$  AND  $TLD > 60$  minutes

All this condition will exist during 10 seconds

$OCT$  – Outdoor Coil Temperature

$OAT$  – Outdoor Air Temperature

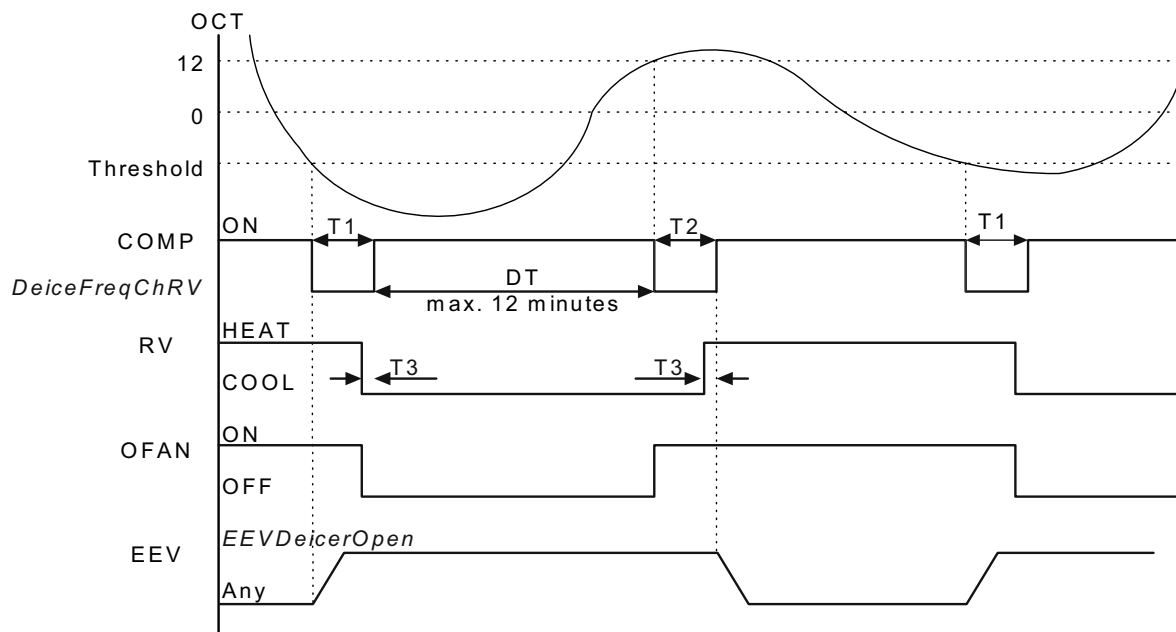
$TLD$  – Time from Last Deicing

$DI$  – Deicing Interval (Time Interval Between Two Deicing)

Deicing interval time when compressor is first started in heat mode, is 10 minutes if  $OCT < -2$ , and is 40 minutes in other cases.

Deicing interval time is changed (increased/ decreased in 10 minutes steps) as a function of deicing time. If deicing time is shorter than former deicing time, the deicing interval time will be increased. If deicing time is longer than former deicing time, the deicing interval time will be decreased.

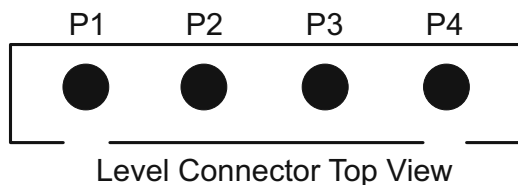
- Deicing Operation Procedure



T1=60 secondes;T2=36 secondes;T3=6 secondes

T1=50 secondes;T2=36 secondes;T3=6 secondes

### 13.1.20 Condensate Water Over Flow Protection



Each of the pins P1, P2, P3 can have two options:

1 – When it is shorted with P4

0 – When it is not shorted to P4

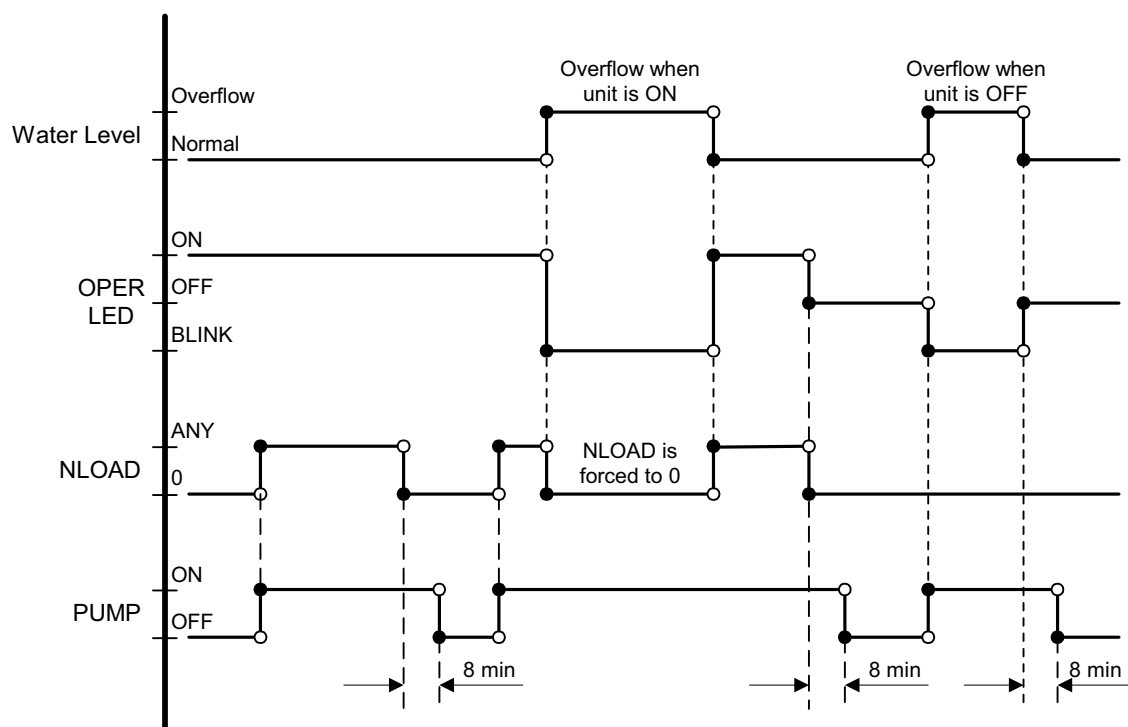
P1	P2	P3	Level
Don't care	Don't care	1	Normal
Don't care	Don't care	0	Overflow

(\*) 1- Pin P1, P2, or P3 is connected to P4.

0- Pin P1, P2 or P3 is not connected to P4.

#### **For DLF unit:**

In case of vertical installation, change dipswitch 7 to OFF position to cancel Water Pump operation.



### 13.1.21 Operating the Unit from Mode Button (On display)

Forced operation allows to start, stop and operate in Cooling or Heating, in pre-set temperature according to the following table:

Forced operation Mode	Pre-set Temperature
Cooling	20°C
Heating	28°C

### 13.1.22 On Unit Controls and Indicators

#### 13.1.22.1 Indoor Unit controller Controls and Indications for All Models Except for Floor/Ceiling model

During OFF, Fan, Cool, Heat, Dry, and Auto modes (for operation in other modes, see at the relevant spec paragraph):

STAND BY/OPERATION INDICATOR	<ul style="list-style-type: none"> <li>Lights up when the Air Conditioner is connected to power and ready to receive the R/C commands</li> <li>Lights up during operations. Blinks when compressor is stopped as a result of a thermodynamic protection.</li> </ul>
ESF/INOIZER INDICATOR	<ul style="list-style-type: none"> <li>Lights up during ESF/ ionizer operation.</li> </ul>
TIMER INDICATOR	<ul style="list-style-type: none"> <li>Lights up during Timer and Sleep operation.</li> </ul>
FILTER INDICATOR	<ul style="list-style-type: none"> <li>Lights up when Air Filter needs to be cleaned.</li> </ul>
MODE/RESET BUTTON	<ul style="list-style-type: none"> <li>Every short pressing , the next operation mode is selected, in this order : SB → Cool Mode → Heat Mode → SB → ...</li> <li>Press to turn off the filter indicator and to reset the filter function, after the cleaned filter has been reinstalled.</li> <li>In long pressing the system enters into diagnostic mode.</li> </ul>

### 13.1.22.2 Outdoor Unit controller Indicators

Unit has three LED's.

SB LED is ON when power is ON (230 VAC, even when no communication).

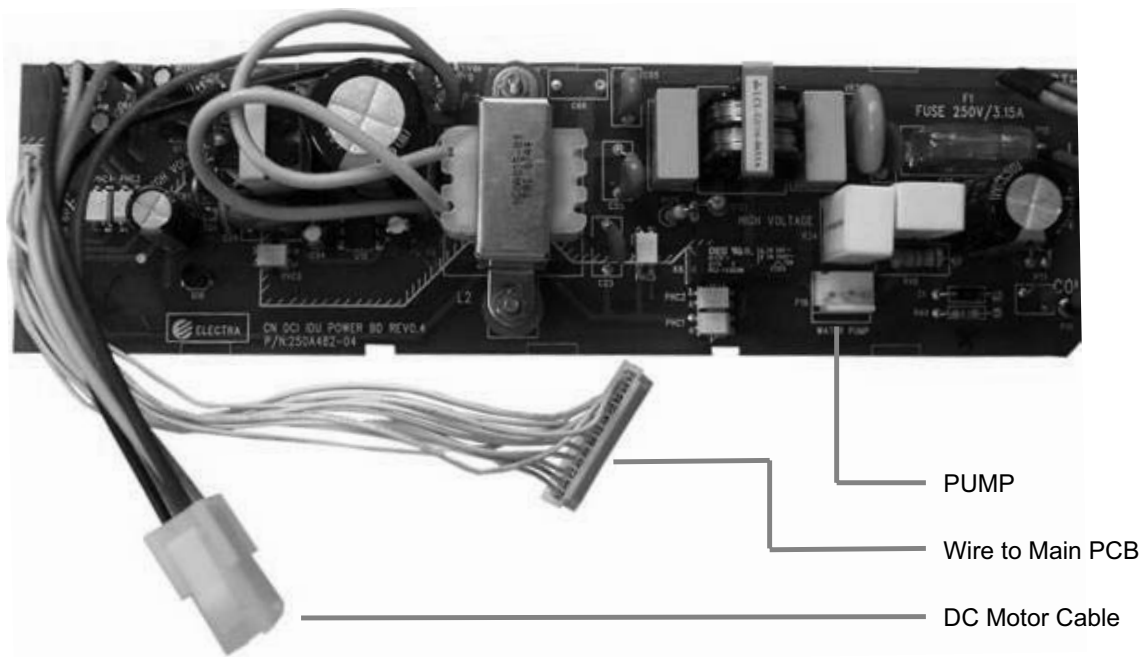
STATUS LED is ON when COMP is ON, and Blinks according to diagnostics mode definitions when either fault or protection occurs.

FAULT LED Blinks according to diagnostics mode definitions when either fault or protection occurs.

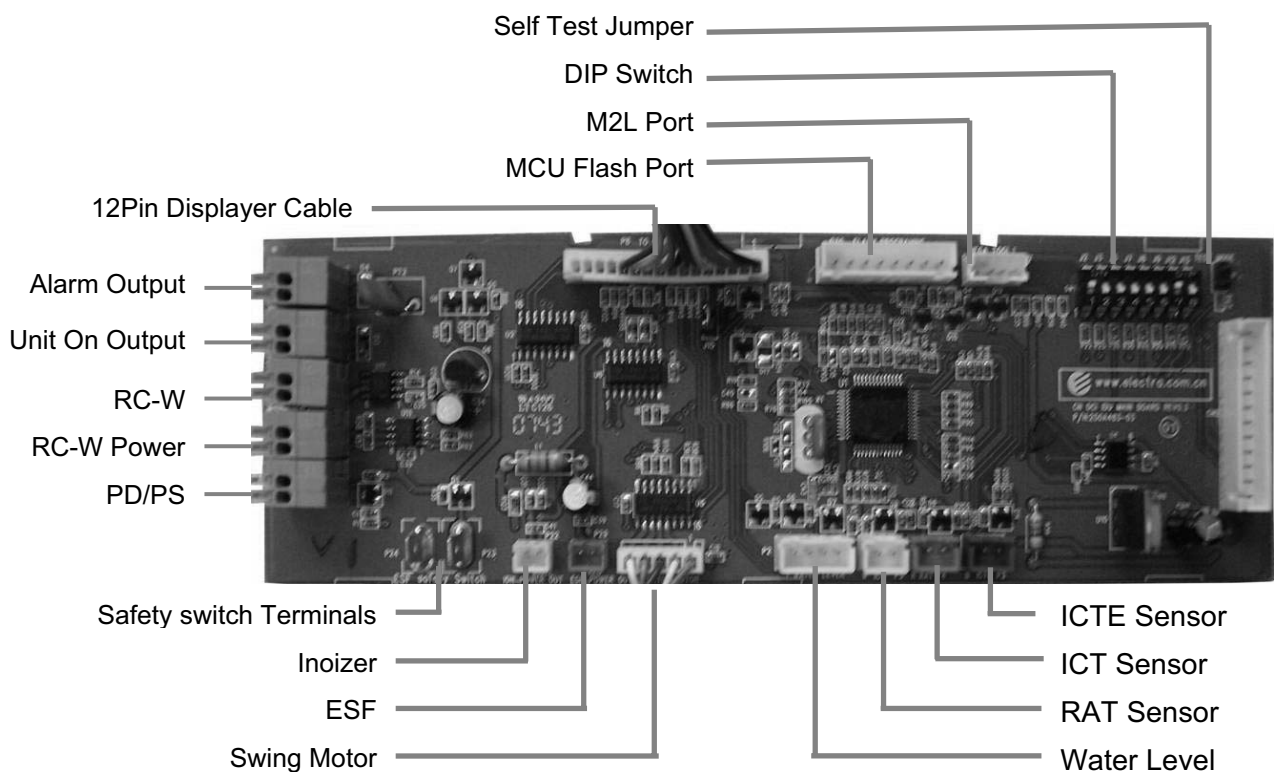
### 13.1.23 DIP switch settings

Indoor Unit Controller

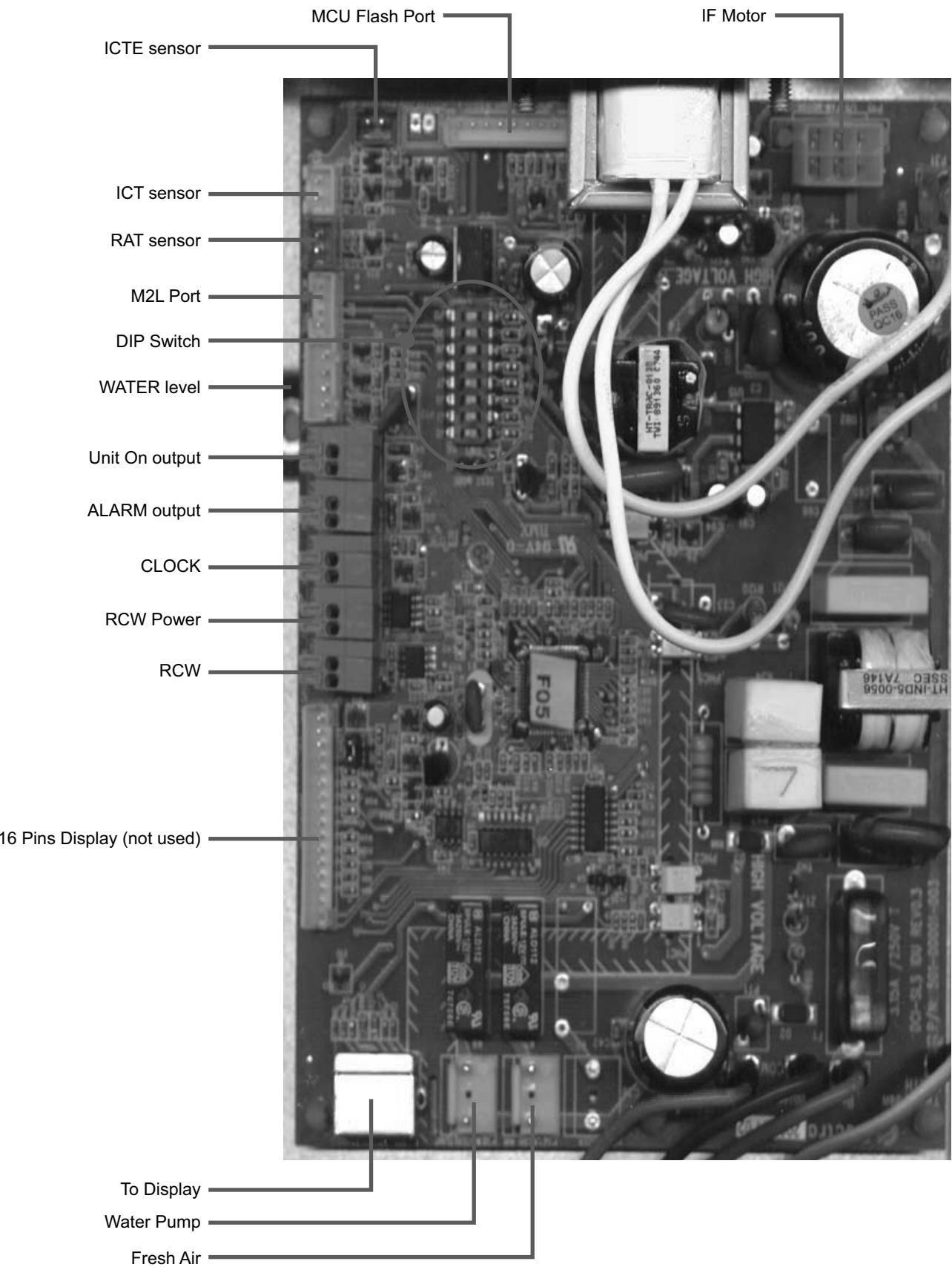
#### 13.1.23.1 Power PCB - CK



#### 13.1.23.2 Main PCB - CK



13.1.23.3 Main PCB – DLF



**13.1.24 Self Test Jumper(J1))**

- Jumper for production line only, never install jumper on site!

**13.1.25 DIP Switch and Jumper Settings**

- CK - Dip switch default setting for each model

MODEL \ DIP	1	2	3	4	5	6	7	8
	J2	J3	J6	J7	J8	J9	J12	J13
2.5 KW	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
3.5 KW	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
5.0 KW	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
6.0 KW	ON	ON	OFF	ON	OFF	OFF	ON	OFF
7.0 KW	ON	ON	OFF	OFF	ON	OFF	ON	OFF

- DLF - Dip switch default setting for each model

MODEL \ DIP	1	2	3	4	5	6	7*	8**
	J2	J3	J5	J7	J8	J9	J10	J12
2.5 KW	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
3.5 KW	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
5.0 KW	ON	OFF	OFF	ON	ON	OFF	ON	OFF
6.0 KW	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
7.0 KW	ON	ON	OFF	ON	OFF	OFF	ON	OFF

\*Water pump and float switch setting

In case of vertical installation, change dipswitch 7 to OFF position to cancel their operation.

\*\*High external static pressure

There is an option of increasing the airflow if the ESP (external static pressure) is higher than planned. To increase the speed change dipswitch 8 to ON position.

- **Compensation setting (Factory setting)**

This setting activates the compensation to the return air temperature in heating mode. For indoor unit like cassette, the DIP switch J2 should be ON.

Compensation	J2
Activated(factory setting)	ON
Deactivated	OFF

- **Unit model setting (Factory setting)**

The unit model setting should be in accordance with the unit model on the nameplate. The unit operating parameters will be improper with wrong settings.

Unit model(Capacity)	J3	J6	J7	J8
2.5kW model	OFF	OFF	OFF	OFF
3.5kW model	OFF	OFF	ON	OFF
5.0kW model	ON	OFF	OFF	OFF
6.0kW model	ON	OFF	ON	OFF
7.0kW model	ON	OFF	OFF	ON

- **Presence Detector/Power Shedding Selection**

Select the functions of dry contact PD/PS by setting the Dip switch J9

Selection	J9
Presence Detector	OFF
Power Shedding	ON

- **Installation of height compensation settings (By installer)**

The compensation settings according to installation height should be set by using the dip switch J12, J13 on the controller PCB

Installation Height	J12	J13	Installation height
H0	OFF	OFF	2.1-2.7m
H1(Factory setting)	ON	OFF	2.7-3.3m
H2	OFF	ON	>3.3m
H3	ON	ON	Reserved

Compensation data according to the installation height

Installation Height	Speed Compensation for Heating Mode		Speed Compensation for other Modes		Temperature compensation in heating mode	
	CK	DLF	CK	DLF	CK	DLF
H0	-50	0	-50	0	4	2
H1	0	150	0	150	4	2
H2	100	150	100	150	6	2
H3	150	150	150	150	7	2

**IDU Diagnostic Table.**

- **Alarm Output**

The Alarm Output dry contact will be on (closed), when a predefined set faults occur.

The fault set is defined under diagnostics section.

The alarm output will be off (open), when the predefined fault is cleared.

The indoor alarm outputs are defined according to the following IDU Diagnostic Table:

No	Problem	AO	5	4	3	2	1
1	ICT is disconnected	Yes	0	0	0	0	1
2	ICT is shorted	Yes	0	0	0	1	0
3	RAT is disconnected	Yes	0	0	0	1	1
4	RAT is shorted	Yes	0	0	1	0	0
5	Reserved (for MSMP used as RGT fault)	No	0	0	1	0	1
*6	ICTE shorted/disconnected (when enabled)	Yes	0	0	1	1	0
7	Undefined IDU family/model	Yes	0	0	1	1	1
8	No Communication	Yes	0	1	0	0	0
9	No Encoder	No	0	1	0	0	1
10	Reserved	No	0	1	0	1	0
11	Outdoor Unit Fault	No	0	1	0	1	1
...	Reserved	No					
17	Defrost protection	No	1	0	0	0	1
18	Deicing Protection	No	1	0	0	1	0
19	Outdoor Unit Protection	No	1	0	0	1	1
20	Indoor Coil HP Protection	No	1	0	1	0	0
21	Overflow Protection	Yes	1	0	1	0	1
22	Reserved	No					
24	EEPROM Not Updated	No	1	1	0	0	0
25	Bad EEPROM	No	1	1	0	0	1
26	Bad Communication	No	1	1	0	1	0
27	Using EEPROM data	No	1	1	0	1	1
28	Model A	No	1	1	1	0	0
29	Model B	No	1	1	1	0	1
30	Model C	No	1	1	1	1	0
31	Model D	No	1	1	1	1	1

\* CK Unit only



**ODU Diagnostic Table**

AO - Alarm output

No	Problem	AO	5	4	3	2	1
1	OCT is disconnected	Yes	0	0	0	0	1
2	OCT is shorted	Yes	0	0	0	1	0
3	CTT is disconnected	Yes	0	0	0	1	1
4	CTT is shorted	Yes	0	0	1	0	0
5	HST is disconnected (when enabled)	Yes	0	0	1	0	1
6	HST is shorted (when enabled)	Yes	0	0	1	1	0
7	OAT is disconnected (when enabled)	Yes	0	0	1	1	1
8	OAT is shorted (when enabled)	Yes	0	1	0	0	0
9	TSUC is disconnected (when enabled)	Yes	0	1	0	0	1
10	TSUC is shorted (when enabled)	Yes	0	1	0	1	0
11	IPM Fault	Yes	0	1	0	1	1
12	Bad EEPROM	No	0	1	1	0	0
13	DC under voltage	Yes	0	1	1	0	1
14	DC over voltage	Yes	0	1	1	1	0
15	AC under voltage	Yes	0	1	1	1	1
16	Mismatch IDU & ODU models (*SW 35V14 and above)	Yes	1	0	0	0	0
17	No Communication	Yes	1	0	0	0	1
18	Reserved	No	1	0	0	1	0
20	Heat sink Over Heating	No	1	0	1	0	0
21	Deicing	No	1	0	1	0	1
22	Compressor Over Heating	No	1	0	1	1	0
23	Compressor Over Current	No	1	0	1	1	1
24	No OFAN Feedback	No	1	1	0	0	0
25	OFAN locked	Yes	1	1	0	0	1
26	Compressor Lock	Yes	1	1	0	1	0
27	Bad Communication	No	1	1	0	1	1
28	Missing ODU configuration (*SW 35V14 and above)	Yes	1	1	1	0	0
29	Undefined ODU Model (*SW 35V14 and above)	Yes	1	1	1	0	1
30	For future use	No	1	1	1	1	0
31	Operation condition is exceeded (*SW 35V14 and above)	Yes	1	1	1	1	1

\*Alarm Output - is on SW 35V14 and above. There is no alarm on SW 35V12 and below/

- Unit ON Output**

The 'On/Off status' dry contact will be on (closed), when the indoor mode is not STBY.

If the indoor mode is STBY mode, the 'On/Off status' will be off (open).

- PD/PS(Presence Detector/Power Shedding)**

	Function	Contact=open	Contact=short
J9=open	Presence Detector Connection	Last Mode	Force to STBY
J9=short	Power Shedding Function	No limit	Limit NLOAD

### 13.1.25 Outdoor Unit Controller

#### 13.1.25.1 Outdoor Unit Controller - Jumper setting

JP9 Jumper Layout

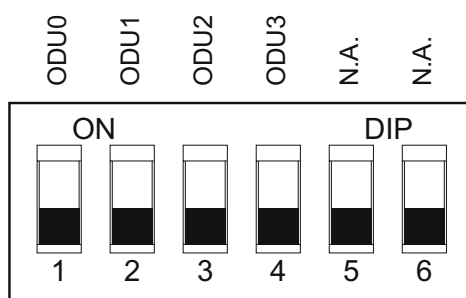
<b>Reserved (PIN 9)</b>	<b>ODU3 (PIN 7)</b>	<b>ODU2 (PIN 5)</b>	<b>ODU1 (PIN 3)</b>	<b>ODU0 (PIN 1)</b>
<b>GND (PIN 10)</b>	<b>GND (PIN 8)</b>	<b>GND (PIN 6)</b>	<b>GND (PIN 4)</b>	<b>GND (PIN 2)</b>

### 13.1.26 ODU Model Selection

ODU3	ODU2	ODU1	ODU0	ODU Model
OFF	OFF	OFF	ON	A (Single DCI 25)
OFF	OFF	ON	OFF	B (Single DCI 35)
OFF	OFF	ON (PIN3 & PIN4)	ON (PIN1 & PIN2)	C (Single DCI 50)
OFF	ON (PIN5 & PIN6)	OFF	OFF	D (Single DCI 60)
ON (PIN7 & PIN8)	ON (PIN5 & PIN6)	OFF	OFF	L (Single DCI 72Z)

### 13.1.27 Outdoor Unit Controller

#### 13.1.27.1 Outdoor Unit Controller - DIP Switch setting



ODU MODEL SETTING

ODU3	ODU2	ODU1	ODU0	ODU MODEL
OFF	OFF	OFF	ON	DCI 25
OFF	OFF	ON	OFF	DCI 35
OFF	OFF	ON	ON	DCI 50
OFF	ON	OFF	OFF	DCI 60
ON	ON	OFF	OFF	DCI 72Z

## 13.2 Test Mode

### 13.2.1 Entering Test Mode

System can enter Test mode in two ways:

Automatically when the following conditions exists for 30 minutes continuously:

Mode = Cool, Set point = 16, Room temperature =  $27(+1/-2)$ , Outdoor temperature =  $35(+2/-1)$

Or

Mode = Heat, Set point = 30, Room temperature =  $20 \pm 1$ , Outdoor temperature =  $7 \pm (+1/-2)$

Manually when entering diagnostics with the following settings:

Mode = Cool, Set point = 16

Mode = Heat, Set point = 30

### 13.2.3 Unit Operation in Test Mode

In test mode, the unit will operate in fixed settings according to the indoor fan speed setting:

Indoor FAN Speed Setting	Unit Setting
Low	Minimum Capacity Setting
Turbo	Nominal Capacity Setting
Auto	Maximum Capacity Setting

During test mode, protections are disabled, except for stop compressor status.

## 13.3 Parameters

### 13.3.1 General Parameters for all models

#	Name	Values(Factory Setting)
1	CVStep	0
2	Cool2Heat	3
3	Heat2Cool	3
4	ICTDef1	8
5	ICTDef2	6
6	ICTDef3	4
7	ICTDef4	2
8	ICTDef5	0
9	ICTDef6	-2
10	ICTDeltaDef1	1
11	ICTDeltaDef2	-1
12	ICTDeltaOH1	-1
13	ICTDeltaOH2	1
14	FLTRTime	1023
15	PITconst	30
16	STARTTIMETURBOH	10
17	IFANOffTimeDry	3
18	IFANOnTimeDry	1
19	ICTLowLimitDry	10
20	ICTHighLimitDry	12
21	ExtraNLOADDry	20
22	IFANMAXTimeH	150
23	IFANOffTimeH	4
24	IFANOnTimeH	3
25	IFANTimeHeat2STBY	30
26	MAXTURBOTIMEF	30
27	MAXTURBOTIMEC	30
28	MAXTURBOTIMEH	30

### 13.3.2 Family Dependent Parameter

#	Name	CK <sub>A</sub>	CK <sub>B</sub>	DLF <sub>A</sub>	DLF <sub>B</sub>
1	<i>BasicCV1</i>	4	4	2	2
2	<i>BasicCV2</i>	4	4	2	2
3	<i>BasicCV3</i>	6	6	2	2
4	<i>BasicCV4</i>	7	7	2	2
5	<i>Max_Swg</i>	40	40	NA	NA
6	<i>Min_H_Angle</i>	5	5	NA	NA
7	<i>Max_H_Angle</i>	40	40	NA	NA
8	<i>Min_C_Angle</i>	5	5	NA	NA
9	<i>Max_C_Angle</i>	40	40	NA	NA
10	<i>MTR_Cls_Dir</i>	C	C	NA	NA
11	<i>MTR_Cls_Dir_V</i>	C	C	NA	NA
12	<i>Max_Angle_V</i>	NA	NA	NA	NA
13	<i>Min_Angle_V</i>	NA	NA	NA	NA
14	<i>Max_Swg_V</i>	NA	NA	NA	NA
15	<i>IFSPCHNA</i>	10	10	10	10
16	<i>IFSPCHND</i>	4	4	10	10
17	<i>IFSPCHAA</i>	6	6	6	6
18	<i>IFSPCHAD</i>	4	4	6	6
19	<i>IFSTARTSPEED</i>	670	670	670	670
20	<i>ICTSTSpeed</i>	25	25	25	25
21	<i>ICTVLSpeed</i>	28	28	28	28
22	<i>ICTLSpeed</i>	30	30	30	30
23	<i>ICTHSpeed</i>	32	32	32	32
24	<i>ICTTSpeed</i>	40	40	35	35
25	<i>NLOADHForcedValue</i>	60	60	60	60
26	<i>ICTOH1</i>	45	45	49	49
27	<i>ICTOH2</i>	48	48	51	51
28	<i>ICTOH3</i>	52	52	53	53
29	<i>ICTOH4</i>	55	55	55	55
30	<i>ICTOH5</i>	60	60	60	60
31	<i>ICTOH6</i>	62	62	62	62
32	<i>ICTEEnable</i>	1	1	0	0

## 13.3.3 Indoor Model Parameters:

Indoor Family	CK <sub>A</sub>		CK <sub>B</sub>			DLF <sub>A</sub>			DLF <sub>B</sub>	
Indoor Model Parameter	A (CK25)	B (CK 35)	A (CK50)	B (CK 60)	C (CK72)	A (DLF25)	B (DLF35)	C (DLF50)	A (DLF60)	B (DLF72)
IFVLOWC	250	300	450	500	550	670	690	800	900	900
IFLOWC	450	450	550	600	650	740	730	860	960	980
IFMEDC	500	520	620	660	700	810	860	980	1050	1050
IFHIGHC	550	600	680	720	750	920	980	1100	1170	1200
IFTURBOC	650	700	800	900	1000	960	1060	1170	1240	1280
IFVLOWH	250	300	450	500	550	670	690	800	900	900
IFLOWH	450	450	550	600	650	740	730	860	960	980
IFMEDH	520	550	620	660	700	810	860	980	1050	1050
IFHIGHH	600	650	680	720	750	920	980	1100	1170	1200
IFTURBOH	650	700	850	950	1000	960	1060	1220	1240	1280
Cap .Group	0	1	3	3	4	0	1	3	3	4
NomLoadC	40	62	66	81	62	40	60	64	79	54
NomLoadH	52	67	67	81	57	57	70	73	82	57
MaxNLOADIF1C	47	42	55	56	50	127	127	127	127	127
MaxNLOADIF2C	70	60	78	81	70	127	127	127	127	127
MaxNLOADIF3C	127	127	127	127	127	127	127	127	127	127
MaxNLOADIF4C	127	127	127	127	127	127	127	127	127	127
MaxNLOADIF5C	127	127	127	127	127	127	127	127	127	127
IFAN_SPEED_COMP0_C	-50	-50	-50	-50	-50	0	0	0	0	0
IFAN_SPEED_COMP1_C	0	0	0	0	0	150	150	150	150	150
IFAN_SPEED_COMP2_C	100	100	100	100	100	150	150	150	150	150
IFAN_SPEED_COMP3_C	150	150	150	150	150	150	150	150	150	150
IFAN_SPEED_COMP0_H	-50	-50	-50	-50	-50	0	0	0	0	0
IFAN_SPEED_COMP1_H	0	0	0	0	0	150	150	150	150	150
IFAN_SPEED_COMP2_H	100	100	100	100	100	150	150	150	150	150
IFAN_SPEED_COMP3_H	150	150	150	150	150	150	150	150	150	150
ModelEnable	1	1	1	1	1	1	1	1	1	1

**13.3.4 Outdoor Parameters***General Parameters ( for every software):*

#	Name	Default Value
1	<i>MinOFFTime</i>	3
2	<i>MinONTime</i>	3
3	<i>OFSPCH</i>	4
4	<i>Down1</i>	3
5	<i>Down2</i>	10
6	<i>Dlmin</i>	30
7	<i>Dlmax</i>	120
8	<i>TimeD</i>	1
9	<i>DTmin</i>	2
10	<i>DTmax</i>	12
11	<i>DIT</i>	10
12	<i>CTMRUP</i>	15
13	<i>DIF</i>	30
14	<i>TCT</i>	10
15	<i>HSTOH1</i>	78
17	<i>HSTOH2</i>	80
18	<i>HSTOH3</i>	82
19	<i>HSTOH4</i>	85
20	<i>HSTOH5</i>	90
21	<i>HSTOHDelta1</i>	-1
22	<i>HSTOHDelta2</i>	1
23	<i>EEVCVTConst</i>	30
24	<i>BalanceTime</i>	5
25	<i>EEVInitOpen</i>	300

## 13.3.5 ODU Model Dependent Parameters ( 35V12 )

#	Outdoor Model Parameter	A Single DCI-25	B Single DCI-35	C Single DCI-50	D Single DCI 60
1	MinFreqC	30	33	20	20
2	MaxFreqC	64	80	85	95
3	MinFreqH	30	35	20	26
4	MaxFreqH	81	93	95	94
5	NormAccel	1	1	1	1
6	NormDecel	1	1	1	1
7	Step1Freq	60	60	60	60
8	Step2Freq	70	70	70	70
9	Step3Freq	90	90	90	90
10	OFVL	20	20	20	20
11	OFLOWC	55	55	60	55
12	OFMEDC	70	70	76	70
13	OFMAXC	83	83	92	79
14	OFLOWH	55	55	60	55
15	OFMEDH	70	70	83	70
16	OFMAXH	83	83	100	79
17	OFANTESTMODEC	83	83	92	83
18	OFANTESTMODEH	83	83	100	83
19	OFDelTestMode	20	20	28	28
20	CTTOH1	94	94	94	94
21	CTTOH2	98	98	98	98
22	CTTOH3	102	102	102	102
23	CTTOH4	105	105	105	105
24	CCROC1	7.1	7.1	10	11.4
25	CCROC2	7.5	7.5	10.5	11.8
26	CCROC3	7.9	7.9	10.8	12.2
27	CCROC4	8.3	8.3	11.2	12.6
28	DEICT1	60	60	60	60
29	DEICT2	36	36	36	36
30	DEICT3	6	6	6	6
31	ProtFreqLimit	60	60	60	60
32	EEVDecierOpen	180	180	100	180
33	OptimDeicFreq	90	90	90	90
34	EEVMinOperOpenC	50	50	50	80
35	EEVMaxOperOpenC	380	380	380	380
36	EEVMinOperOpenH	50	50	50	60
37	EEVMaxOperOpenH	300	300	380	300
38	EEVNormRate	33	33	33	33
39	EEVHighRate	12	12	12	12
40	EEVMaxOpen	500	500	500	500
41	OFLowFreqC	45	45	40	35
42	OFMedFreqC	57	57	70	55
43	OFLowFreqH	45	45	40	40
44	OFMedFreqH	57	57	86	60
45	HeaterDisableFlag	0	0	0	0
46	DeiceFreqChRV	0	0	0	0
47	OATRefC	35	35	35	35
48	SUCT Enable	0	0	0	0
49	HST Enable	0	0	1	1
50	OAT Enable	1	1	1	1
51	OATRefH	7	7	7	7
52	MinTargCTTC	30	30	30	30
53	MaxTargCTTC	95	95	95	90
54	MinTargCTTH	40	40	40	45
55	MaxTargCTTH	95	95	95	90
56	DST	8	8	8	8
57	DSTF	12	12	12	12
58	OATLimitC	24	24	28	28
59	OATLimit1H	6	6	6	6
60	OATLimit2H	15	15	15	15
61	MaxFreqAsOATC	50	50	64	85
62	MaxFreqAsOAT1H	65	75	85	80
63	MaxFreqAsOAT2H	60	60	60	60

## 13.3.6 ODU Model Dependent Parameters ( 35V14 )

#	Outdoor Model Parameter	A Single DCI-25	B Single DCI-35	C Single DCI-50	D Single DCI 60
1	MinFreqC	30	33	20	20
2	MaxFreqC	64	80	85	95
3	MaxFreqCRunPhase	64	80	85	95
4	MinFreqH	30	35	20	26
5	MaxFreqH	81	93	95	94
6	MaxFreqHRunPhase	81	93	95	94
7	LoadDeadZoneC	90	95	95	111
8	LoadDeadZoneH	127	127	127	127
9	NormAccel	1	1	1	1
10	NormDecel	1	1	1	1
11	Step1Freq	60	60	60	60
12	Step2Freq	70	70	70	70
13	Step3Freq	90	90	90	90
14	OFVL	20	20	20	20
15	OFLOWC	55	55	60	55
16	OFMEDC	70	70	76	70
17	OFMAXC	83	83	92	79
18	OFLOWH	55	55	60	55
19	OFMEDH	70	70	83	70
20	OFMAXH	83	83	100	79
21	OFANTESTMODEC	83	83	92	83
22	OFANTESTMODEH	83	83	100	83
23	OFDelTestMode	20	20	28	28
24	CTTOH1	94	94	94	94
25	CTTOH2	98	98	98	98
26	CTTOH3	102	102	102	102
27	CTTOH4	105	105	105	105
28	CCROC1	7.1	7.1	10	11.4
29	CCROC2	7.5	7.5	10.5	11.8
30	CCROC3	7.9	7.9	10.8	12.2
31	CCROC4	8.3	8.3	11.2	12.6
32	DEICT1	60	60	60	60
33	DEICT2	36	36	36	36
34	DEICT3	6	6	6	6
35	ProtFreqLimit	60	60	60	60
36	EEVDecierOpen	180	180	100	180
37	OptimDeicFreq	90	90	90	90
38	OCTExitDeicer	12	12	12	12
39	MaxDeicerTime	12	12	12	12
40	EEVMinOperOpenC	50	50	50	80
41	EEVMaxOperOpenC	380	380	380	380
42	EEVMinOperOpenH	50	50	50	60
43	EEVMaxOperOpenH	300	300	380	300
44	EEVNormRate	33	33	33	33
45	EEVHighRate	12	12	12	12
46	EEVMaxOpen	500	500	500	500
47	OFLowFreqC	45	45	40	35
48	OFMedFreqC	57	57	70	55
49	OFLowFreqH	45	45	40	40
50	OFMedFreqH	57	57	86	60
51	HeaterDisableFlag	0	0	0	0
52	DeiceFreqChRV	0	0	0	0
53	OATRefC	35	35	35	35
54	SUCT Enable	0	0	0	0
55	HST Enable	1	1	1	1
56	OAT Enable	1	1	1	1
57	OATRefH	7	7	7	7
58	MinTargCTTC	30	30	30	30
59	MaxTargCTTC	95	95	95	90
60	MinTargCTTH	40	40	40	45
61	MaxTargCTTH	95	95	95	90
62	DST	8	8	8	8
63	DSTF	12	12	12	12
64	OATLimitC	24	24	28	28
65	OATLimit1H	6	6	6	6
66	OATLimit2H	15	15	15	15
67	MaxFreqAsOATC	50	50	64	85
68	MaxFreqAsOAT1H	65	75	85	80
68	MaxFreqAsOAT2H	60	60	60	60
69	EnableExceedCond	0	0	0	0



## 13.3.7 ODU Model Dependent Parameters ( 36V1-S01 )

#	Outdoor Model Parameter	L Single DCI-72Z
1	MinFreqC	15
2	MaxFreqC	70
3	MinFreqH	15
4	MaxFreqH	90
7	Step1Freq	35
8	Step2Freq	55
9	Step3Freq	90
10	OFMinRPM	8
11	OFMaxRPM	90
12	NightRPM	65
13	OFNNoiseMaxRPM	78
14	CTTOH1	90
15	CTTOH2	95
16	CTTOH3	100
17	CTTOH4	105
18	CCROC1	12.5
19	CCROC2	13.3
20	CCROC3	14.1
21	CCROC4	14.9
22	ProtFreqLimit	60
23	EEVMinOperOpenC	50
24	EEVMaxOperOpenC	480
25	EEVMinOperOpenH	50
26	EEVMaxOperOpenH	480
27	HeaterDisableFlag	0
28	HST Enable	1
29	OATLimitC	25
30	OATLimit1H	4
31	OATLimit2H	15
32	MaxFreqAsOATC	60
33	MaxFreqAsOAT1H	68
34	MaxFreqAsOAT2H	57
35	NormAccel	1
36	NormDecel	1
37	OCTExitDeicer	12
38	MaxDeicerTime	15

## 14. TROUBLESHOOTING

### **WARNING!!!**

When Power Up – the whole outdoor unit controller, including the wiring, is under  
HIGH VOLTAGE!!!

Never open the Outdoor unit before turning off the Power!!!

When turned off, the system is still charged (400V)!!!

It takes about 3 Min. to discharge the system.

Touching the controller before discharging may cause an electrical shock!!!

**For safe handling of the controller please refer to section 14.6 below.**

### 14.1 General DCI Single Split System failures and Corrective Actions

No	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1	Power supply indicator (Red LED) does not light up.	No power supply	Check power supply. If power supply is OK, check display and display wiring. if OK, replace controller.
2	Unit does not respond to remote control message	Remote control message not reached the indoor unit	Check remote control batteries, if batteries are OK, check display and display wiring, if OK, replace display PCB. If still not OK replace controller.
3	Unit responds to remote control message but Operate indicator (Green LED) does not light up	Problem with display PCB	Replace display PCB. If still not OK replace controller.
4	Indoor fan does not start (louvers are opened and Green LED does light up)	Unit in heat mode and coil is still not warm.	Change to cool mode and check.
		Problem with PCB or capacitor	Change to high speed and Check power supply to motor is higher than 130VAC (for triack controlled motor) or higher than 220VAC for fixed speed motors, if OK replace capacitor, if not OK replace controller
5	Indoor fan works when unit is OFF, and indoor fan speed is not changed by remote control command.	PCB problem	Replace controller
6	Compressor does not start	Electronics control problem or protection	Perform diagnostics (See 14.3), and follow the actions described.
7	Compressor stops during operation and Green LED remains on	Electronic control or power supply problem	Perform diagnostics (See 14.3), and follow the actions described.

No	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
8	Compressor is on but outdoor fan does not work	Problem with outdoor electronics or outdoor fan	Check outdoor fan motor according to the procedure in section 14.5.3 , if not OK replace controller
9	Unit works in wrong mode (cool instead of heat or heat instead of cool)	Electronics or power connection to RV	Check RV power connections, if OK, Check RV operation with direct 230VAC power supply, if OK, Replace outdoor controller.
10	All components are operating properly but no cooling or no heating	Refrigerant leak	Check refrigeration system.
11	Compressor is over heated and unit does not generate capacity	EEV problem	Check EEV
12	Units goes into protections and compressor is stopped with no clear reason	Control problem or refrigeration system problem	Perform diagnostics (See 14.3), and follow the actions described.
13	Compressor motor is generating noise and no suction occurs	Phase order to compressor is wrong	Check compressor phase order.
14	Water leakage from indoor unit	Indoor unit drainage tube is blocked	Check and open drainage tube.
15	Freezing of outdoor unit in heat mode and outdoor unit base is blocked with ice		Connect base heater.
16	Unit operates with wrong fan speeds or wrong frequency	Wrong jumper settings	Perform diagnostics (See 14.3), and check if units is operating by EEPROM parameters.

## 14.2 Checking the refrigeration system

Checking system pressures and other thermodynamic measures should be done when system is in Test Mode (in Test mode, system operates in fixed settings). The performance curves given in this manual are given for unit performance in test mode when high indoor fan speed is selected.

Entering test mode:

Set unit to Cool/16 degrees/High indoor fan speed, or Heat/30 degrees/High indoor fan speed, and enter diagnostics.

## 14.3 Judgment by Indoor/Outdoor Unit Diagnostics

Enter diagnostics mode - press for five seconds Mode button in any operation mode.

Acknowledgment is by 3 short beeps and lights of COOL and HEAT LED's. Then, every short pressing of Mode button will scroll between Indoor and Outdoor unit diagnostic modes by the acknowledgment of 3 short beeps and lighting of COOL and HEAT LED's.

During the Outdoor unit diagnostics all four Indoor LED's (STBY, Operate, Filter and Timer) are blinking. When Indoor diagnostics is displayed, all four LED's (STBY, Operate, Filter and Timer) are ON.

When system enters diagnostics mode, only one fault code is shown. Order of priority is from the lower to the higher number. Diagnostics is continuously ON as long as power is ON. The current system operation mode will not be changed.

If no fault occurred in the system, no fault code will be displayed during normal operation mode. The last fault code will be displayed even if the system has recovered from that fault. The last fault will be deleted from the EEPROM after the system has exit diagnostics mode.

In diagnostics mode, system fault / status will be indicated by blinking of Heat & Cool LEDs. The coding method will be as follows:

Heat LED will blink 5 times in 5 seconds, and then will be shut off for the next 5 seconds. Cool LED will blink during the same 5 seconds according to the following Indoor / Outdoor unit tables:

Note: 0 – OFF, 1-ON

### 14.3.1 Indoor Unit Diagnostics

- **Alarm Output**

The Alarm Output dry contact will be on (closed), when a predefined set faults occur.

The fault set is defined under diagnostics section.

The alarm output will be off (open), when the predefined fault is cleared.

The indoor alarm outputs are defined according to the following table:

No	Problem	AO	5	4	3	2	1
1	ICT is disconnected	Yes	0	0	0	0	1
2	ICT is shorted	Yes	0	0	0	1	0
3	RAT is disconnected	Yes	0	0	0	1	1
4	RAT is shorted	Yes	0	0	1	0	0
5	Reserved (for MSMP used as RGT fault)	No	0	0	1	0	1
*6	ICTE shorted/disconnected (when enabled)	Yes	0	0	1	1	0
*7	Undefined IDU family/model	Yes	0	0	1	1	1
8	No Communication	Yes	0	1	0	0	0
9	No Encoder	No	0	1	0	0	1
10	Reserved	No	0	1	0	1	0
11	Outdoor Unit Fault	No	0	1	0	1	1
...	Reserved	No					
17	Defrost protection	No	1	0	0	0	1
18	Deicing Protection	No	1	0	0	1	0
19	Outdoor Unit Protection	No	1	0	0	1	1
20	Indoor Coil HP Protection	No	1	0	1	0	0
21	Overflow Protection	Yes	1	0	1	0	1
22	Reserved	No					
24	EEPROM Not Updated	No	1	1	0	0	0
25	Bad EEPROM	No	1	1	0	0	1
26	Bad Communication	No	1	1	0	1	0
27	Using EEPROM data	No	1	1	0	1	1

No	Problem	AO	5	4	3	2	1
28	Model A	No	1	1	1	0	0
29	Model B	No	1	1	1	0	1
30	Model C	No	1	1	1	1	0
31	Model D	No	1	1	1	1	1

\* CN / LSN Units only

### 14.3.2 Indoor Unit Diagnostics and Corrective Actions

No.	Fault	Probable Cause	Corrective Action
1	Sensor failures of all types		Check sensor connections or replace sensor
2	Communication mismatch	Indoor and Outdoor controllers are with different versions	Replace Indoor controller
3	No Communication	Communication or grounding wiring is not good.	Check Indoor to Outdoor wiring and grounding
4	No Encoder	Indoor electronics or motor	Check motor wiring, if ok, replace motor, if still not ok, replace Indoor controller.
5	Outdoor Unit Fault	Outdoor controller problem	Switch to Outdoor diagnostics.
6	EEPROM Not Updated	System is using ROM parameters and not EEPROM parameters	No action, unless special parameters are required for unit operation.
7	Bad EEPROM		No action, unless special parameters are required for unit operation.
8	Bad Communication	Communication quality is low reliability	Check Indoor to Outdoor wiring and grounding
9	Using EEPROM data	No problem. System is using EEPRRRROM parameters	

### 14.3.3 Outdoor Unit Diagnostics

The outdoor alarm outputs are defined in the following way:

No	Problem	AO	5	4	3	2	1
1	OCT is disconnected	Yes	0	0	0	0	1
2	OCT is shorted	Yes	0	0	0	1	0
3	CTT is disconnected	Yes	0	0	0	1	1
4	CTT is shorted	Yes	0	0	1	0	0
5	HST is disconnected (when enabled)	Yes	0	0	1	0	1
6	HST is shorted (when enabled)	Yes	0	0	1	1	0
7	OAT is disconnected (when enabled)	Yes	0	0	1	1	1
8	OAT is shorted (when enabled)	Yes	0	1	0	0	0
9	OMT is disconnected (DCI72 / 72Z / 80)	Yes	0	1	0	0	1

No	Problem	AO	5	4	3	2	1
10	OMT is shorted (DCI72 / 72Z / 80)	Yes	0	1	0	1	0
11	IPM Fault	Yes	0	1	0	1	1
12	Bad EEPROM	No	0	1	1	0	0
13	DC under voltage	Yes	0	1	1	0	1
14	DC over voltage	Yes	0	1	1	1	0
15	AC under voltage	Yes	0	1	1	1	1
16	Mismatch IDU & ODU models (*SW 35V14 and above)	Yes	1	0	0	0	0
17	No Communication	Yes	1	0	0	0	1
18	Reserved	No	1	0	0	1	0
20	Heat sink Over Heating	No	1	0	1	0	0
21	Deicing	No	1	0	1	0	1
22	Compressor Over Heating	No	1	0	1	1	0
23	Compressor Over Current	No	1	0	1	1	1
24	No OFAN Feedback	No	1	1	0	0	0
25	OFAN locked	Yes	1	1	0	0	1
26	Compressor Lock	Yes	1	1	0	1	0
27	Bad Communication	No	1	1	0	1	1
28	Missing ODU configuration (*SW 35V14 and above)	Yes	1	1	1	0	0
29	Undefined ODU Model (*SW 35V14 and above)	Yes	1	1	1	0	1
30	For future use	No	1	1	1	1	0
31	Operation condition is exceeded (*SW 35V14 and above)	Yes	1	1	1	1	1

\*Alarm Output - is on SW 35V14 and above. There is no alarm on SW 35V12 and below/

#### 14.3.4 Outdoor Unit Diagnostics and Corrective Actions

No.	Fault	Probable Cause	Corrective Action
1	Sensors failures of all types		Check sensors connections or replace sensors.
2	IPM Fault	Electronics HW problem	Check all wiring and jumper settings, if OK, replace electronics.
3	Bad EEPROM		No action, unless special parameters are required for unit operation.
4	DC under/over Voltage	Electronics HW problem	Check outdoor unit power supply voltage
5	AC under Voltage		Check outdoor unit power supply voltage
6	Indoor / Outdoor unit Communication mismatch	Indoor and Outdoor controllers are with different versions	Replace Indoor controller
7	No Communication	Communication or grounding wiring is not good.	Check Indoor to Outdoor wiring and grounding

No.	Fault	Probable Cause	Corrective Action
8	Compressor Lock		Switch unit to STBY and restart If still not ok check compressor (14.5.4) If comp is ok replace OU controller If compressor is not ok replace compressor
9	Bad Communication	Communication quality is low reliability	Check Indoor to Outdoor wiring and grounding

## 14.4 Judgment by MegaTool

MegaTool is a special tool to monitor the system states.

Using MegaTool requires:

- A computer with RS232C port.
- A connection wire for MegaTool.
- A special MegaTool software.

Use MegaTool according to following procedure:

- Setup MegaTool software: copy the software to the computer.
- Connect RS232C port in computer with MegaTool port in Indoor/Outdoor unit controller by the connection wire.
- Run the software and choose the COM port, you can monitor the A/C system state in monitor tab.

## 14.5 Simple procedures for checking the Main Parts

### 14.5.1 Checking Mains Voltage.

Confirm that the Mains voltage is between 198 and 264 VAC. If Mains voltage is out of this range, abnormal operation of the system is expected. If in range check the Power (Circuit) Breaker and look for broken or loosed cable lugs or wiring mistake(s).

### 14.5.2 Checking Power Input.

If Indoor unit power LED is unlighted, power down the system and check the fuse of the Indoor unit. If the fuse is OK replace the Indoor unit controller. If the fuse has blown, replace the fuse and power up again.

Checking Power Input procedure for the Outdoor unit is the same as with the Indoor unit.

### 14.5.3 Checking the Outdoor Fan Motor.

Enter Test Mode (where the OFAN speed is high)

Check the voltage between lead wires according to the normal value as following:

- Between red wire and black wire: 310VDC +/- 20V
- Between orange wire and black wire: 15VDC +/- 1V
- Between yellow wire and black wire: 2-6VDC

#### 14.5.4 Checking the Compressor.

The compressor is brushless permanence magnetic DC motor. Three coil resistance is same. Check the resistance between three poles. The normal value should be below 0.5 ohm (TBD).

#### 14.5.5 Checking the Reverse Valve (RV).

Running in heating mode, check the voltage between two pins of reverse valve connector, normal voltage is 220VAC.

#### 14.5.6 Checking the electrical expansion valve (EEV).

The EEV has two parts, drive part and valve. The drive part is a step motor; it is ringed on the valve. Check the drive voltage (12VDC). When Outdoor unit is power on, EEV shall run and have click and vibration.

### 14.6 Precaution, Advise and Notice Items

#### 14.6.1 High voltage in Outdoor unit controller.

Whole controller, including the wires that are connected to the Outdoor unit controller may have the potential hazard voltage when power is on. Touching the Outdoor unit controller may cause an electrical shock.

**Advise:** Don't touch the naked lead wire and don't insert finger, conductor or anything else into the controller when power is on.

#### 14.6.2 Charged Capacitors

Three large-capacity electrolytic capacitors are used in the Outdoor unit controller. Therefore, charging voltage (380VDC) remains after power down. Discharging takes about four minutes after power is off. Touching the Outdoor unit controller before discharging may cause an electrical shock.

#### 14.6.3 Additional advises

- When disassemble the controller or the front panel, turn off the power supply.
- When connecting or disconnecting the connectors on the PCB, hold the whole housing, don't pull the wire.
- There are sharp fringes and sting on shell. Use gloves when disassemble the A/C units.



### 15.1 Indoor Unit: DLF 25/35/50



**15.2 Indoor Unit: DLF 25 DCI**

No.	Item	Description	Quantity
1	418400	Coil 7mm 2r 3c R410 DLF35	1
2	418214	Float support	1
3	418951	Air filter AL 750	1
4	418910	Condensat drainag basin small	1
5	418716	Over floe float sensor	1
7	418700	Controller DCI ECP	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECTOR	1
8	438778	WIRED DISPLAY BOX EMD/ELD (RoH)	1
9a	418300	Motor AC 16w DLF	1
9b	418902	Fan D140x150 DLF	2
9c	418901	Fan housing 150 lower DLF	2
9d	418900	Fan housing 150 upper DLF	2
11	407038	MOTOR BRACKET FCR/FCX/EBS	2
12	418202	Fan deck small DLF	1
16	438783	REMOTE CONTROL RC4/RC (RoHS)	1
17	418717	Terminal Block 7P Hoppy	1
19a	400275	THERMISTOR+CAP WTH CONNECTOR L	1
19b	402701	THERMISTOR WTH CONNECTORS L180	1
20	418223	Front panel small	1
21	418227	Bottom panel small	1
22	418216	Nippels cover	1
23	418215	Water pump service cover	1
25a	418219	Air filter trail L	1
25b	418220	Air filter trail R	1
26	418302	WATER PUMP DLF	1
27	418206	Motor support DLF	1
28	418232	Controller cover DCI	1
29	418213	Water pump support	1
30	418916	External water pump nozzle	1
31	418908	Drain tube plug D20	1
32	418953	Drain flexible tub ID26	1
53	433316	BRACKET DNC	4
64	416906	P.C SPACER RS-10	5
65	416910	CABLE HOLDER KWS-1	1
70	418934	Controller DCI ECP assy	1
71	418935	Water pump assy DLF	1

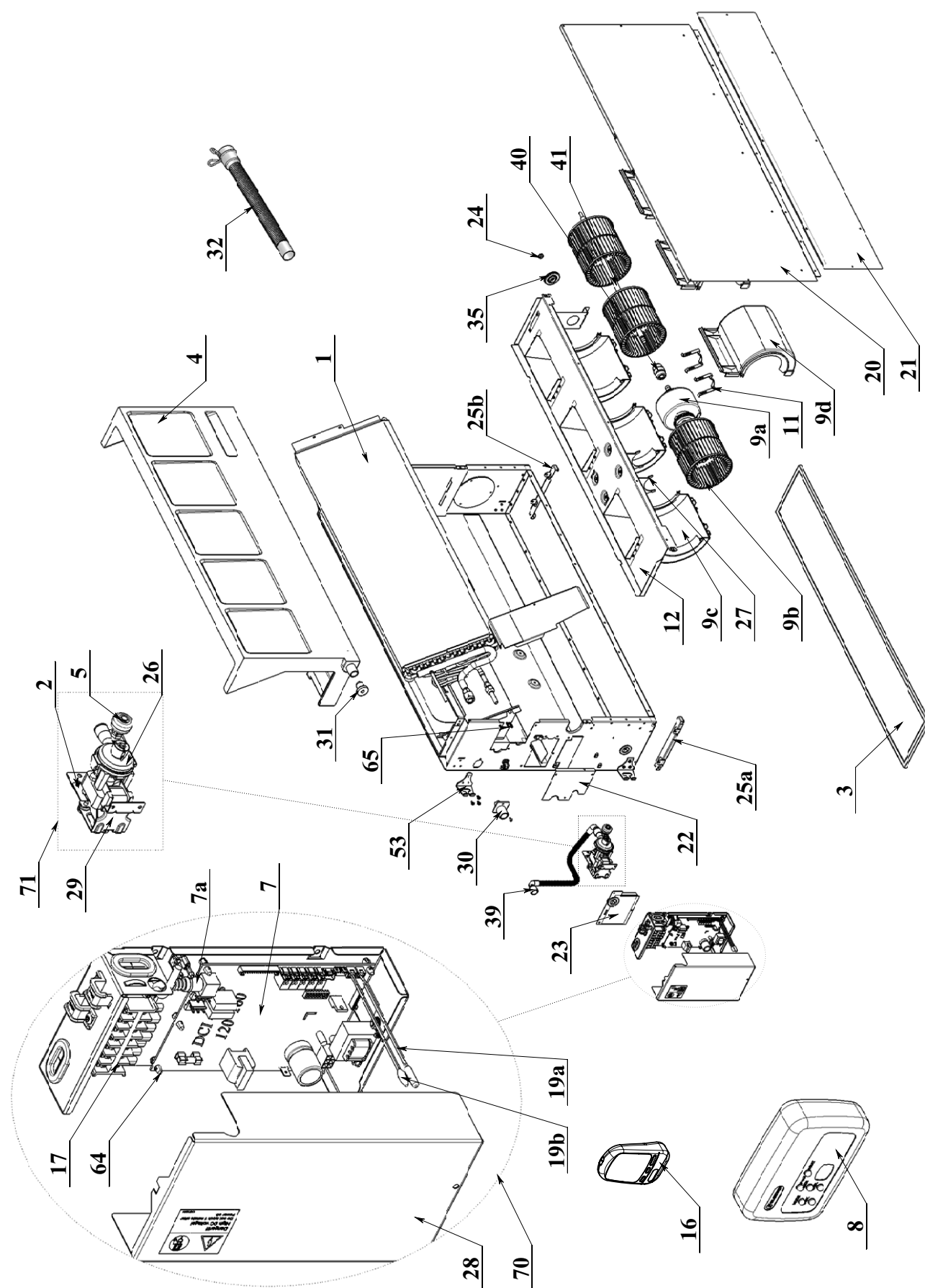
### 15.3 Indoor Unit: DLF 35 DCI

No.	Item	Description	Quantity
1	418400	Coil 7mm 2r 3c R410 DLF35	1
2	418214	Float support	1
3	418951	Air filter AL 750	1
4	418910	Condensat drainag basin small	1
5	418716	Over floe float sensor	1
7	418700	Controller DCI ECP	1
8	438778	WIRED DISPLAY BOX EMD/ELD (RoH)	1
11	407038	MOTOR BRACKET FCR/FCX/EBS	2
12	418202	Fan deck small DLF	1
16	438783	REMOTE CONTROL RC4/RC (RoHS)	1
17	418717	Terminal Block 7P Hoppy	1
20	418223	Front panel small	1
21	418227	Bottom panel small	1
22	418216	Nippels cover	1
23	418215	Water pump service cover	1
26	418302	WATER PUMP DLF	1
27	418206	Motor support DLF	1
28	418232	Controller cover DCI	1
29	418213	Water pump support	1
30	418916	External water pump nozzle	1
31	418908	Drain tube plug D20	1
32	418953	Drain flexible tub ID26	1
53	433316	BRACKET DNC	4
64	416906	P.C SPACER RS-10	5
65	416910	CABLE HOLDER KWS-1	1
70	418934	Controller DCI ECP assy	1
71	418935	Water pump assy DLF	1
19a	400275	THERMISTOR+CAP WTH CONNECTOR L	1
19b	402701	THERMISTOR WTH CONNECTORS L180	1
25a	418219	Air filter trail L	1
25b	418220	Air filter trail R	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECTOR	1
9a	418300	Motor AC 16w DLF	1
9b	418902	Fan D140x150 DLF	2
9c	418901	Fan housing 150 lower DLF	2
9d	418900	Fan housing 150 upper DLF	2

**15.4 Indoor Unit: DLF 50 DCI**

No.	Item	Description	Quantity
1	418401	Coil 7mm 3r 4c R410 DLF50	1
2	418214	Float support	1
3	418951	Air filter AL 750	1
4	418910	Condensat drainag basin small	1
5	418716	Over floe float sensor	1
7	418700	Controller DCI ECP	1
8	438778	WIRED DISPLAY BOX EMD/ELD (RoH)	1
11	407038	MOTOR BRACKET FCR/FCX/EBS	2
12	418202	Fan deck small DLF	1
16	438783	REMOTE CONTROL RC4/RC (RoHS)	1
17	418717	Terminal Block 7P Hoppy	1
20	418223	Front panel small	1
21	418227	Bottom panel small	1
22	418216	Nippels cover	1
23	418215	Water pump service cover	1
26	418302	WATER PUMP DLF	1
27	418206	Motor support DLF	1
28	418232	Controller cover DCI	1
29	418213	Water pump support	1
30	418916	External water pump nozzle	1
31	418908	Drain tube plug D20	1
32	418953	Drain flexible tub ID26	1
53	433316	BRACKET DNC	4
64	416906	P.C SPACER RS-10	5
65	416910	CABLE HOLDER KWS-1	1
70	418934	Controller DCI ECP assy	1
71	418935	Water pump assy DLF	1
19a	400275	THERMISTOR+CAP WTH CONNECTOR L	1
19b	402701	THERMISTOR WTH CONNECTORS L180	1
25a	418219	Air filter trail L	1
25b	418220	Air filter trail R	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECTOR	1
9a	418300	Motor AC 16w DLF	1
9b	418902	Fan D140x150 DLF	2
9c	418901	Fan housing 150 lower DLF	2
9d	418900	Fan housing 150 upper DLF	2

# 15.5 Indoor Unit: DLF 60 / 72 DCI



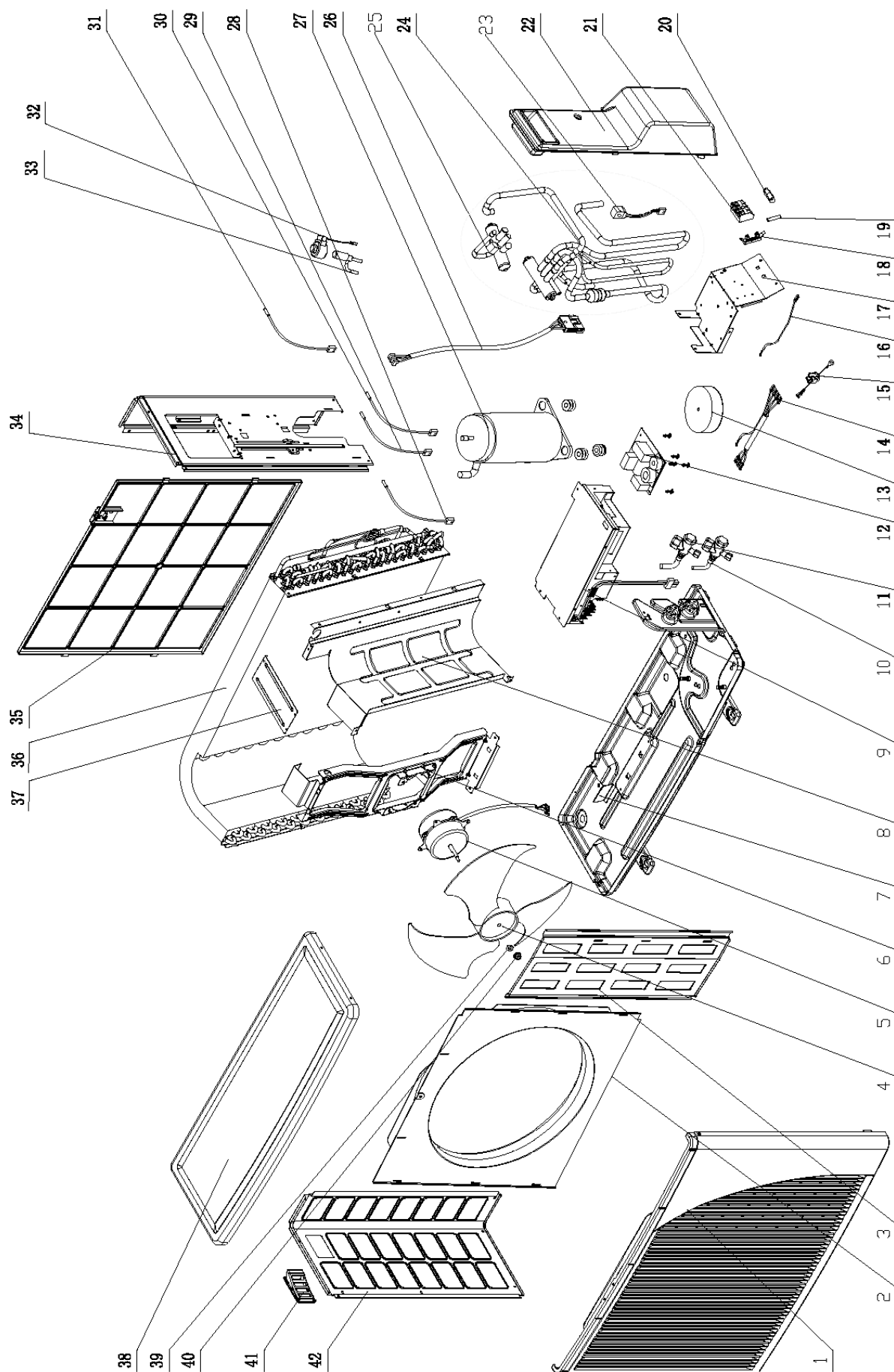
**15.6 Indoor Unit: DLF 60 DCI**

No.	Item	Description	Quantity
1	418402	Coil 7mm 3r 5c R410 DLF60	1
2	418214	Float support	1
3	418952	Air filter AL 1050	1
4	418912	Condensat drainag basin large	1
5	418716	Over floe float sensor	1
7	418700	Controller DCI ECP	1
8	438778	WIRED DISPLAY BOX EMD/ELD (RoH)	1
11	407038	MOTOR BRACKET FCR/FCX/EBS	2
12	418203	Fan deck large DLF	1
16	438783	REMOTE CONTROL RC4/RC (RoHS)	1
17	418717	Terminal Block 7P Hoppy	1
20	418224	Front panel large	1
21	418228	Bottom panel large	1
22	418216	Nippels cover	1
23	418215	Water pump service cover	1
24	442650	FAN BEARING I.D6-O.D14	1
26	418302	WATER PUMP DLF	1
27	418206	Motor support DLF	1
28	418232	Controller cover DCI	1
29	418213	Water pump support	1
30	418916	External water pump nozzle	1
31	418908	Drain tube plug D20	1
32	418953	Drain flexible tub ID26	1
35	430253	MIDDLE FAN BEARING RUBBER SUPP	1
40	418907	Motor axis adaptor DLF	1
41	418906	Motor axis extantion DLF	1
53	433316	BRACKET DNC	4
64	416906	P.C SPACER RS-10	5
65	416910	CABLE HOLDER KWS-1	1
70	418934	Controller DCI ECP assy	1
71	418935	Water pump assy DLF	1
19a	400275	THERMISTOR+CAP WTH CONNECTOR L	1
19b	402701	THERMISTOR WTH CONNECTORS L180	1
25a	418219	Air filter trail L	1
25b	418220	Air filter trail R	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECTOR	1
9a	418301	Motor AC 76w DLF	1
9b	418902	Fan D140x150 DLF	3
9c	418901	Fan housing 150 lower DLF	3
9d	418900	Fan housing 150 upper DLF	3

## 15.7 Indoor Unit: DLF 72 DCI

No.	Item	Description	Quantity
1	418403	Coil 7mm 3r 6c R410 DLF72	1
2	418214	Float support	1
3	418952	Air filter AL 1050	1
4	418912	Condensat drainag basin large	1
5	418716	Over floe float sensor	1
7	418700	Controller DCI ECP	1
8	438778	WIRED DISPLAY BOX EMD/ELD (RoH)	1
11	407038	MOTOR BRACKET FCR/FCX/EBS	2
12	418203	Fan deck large DLF	1
16	438783	REMOTE CONTROL RC4/RC (RoHS)	1
17	418717	Terminal Block 7P Hoppy	1
20	418224	Front panel large	1
21	418228	Bottom panel large	1
22	418216	Nippels cover	1
23	418215	Water pump service cover	1
24	442650	FAN BEARING I.D6-O.D14	1
26	418302	WATER PUMP DLF	1
27	418206	Motor support DLF	1
28	418232	Controller cover DCI	1
29	418213	Water pump support	1
30	418916	External water pump nozzle	1
31	418908	Drain tube plug D20	1
32	418953	Drain flexible tub ID26	1
35	430253	MIDDLE FAN BEARING RUBBER SUPP	1
40	418907	Motor axis adaptor DLF	1
41	418906	Motor axis extantion DLF	1
53	433316	BRACKET DNC	4
64	416906	P.C SPACER RS-10	5
65	416910	CABLE HOLDER KWS-1	1
70	418934	Controller DCI ECP assy	1
71	418935	Water pump assy DLF	1
19a	400275	THERMISTOR+CAP WTH CONNECTOR L	1
19b	402701	THERMISTOR WTH CONNECTORS L180	1
25a	418219	Air filter trail L	1
25b	418220	Air filter trail R	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECTOR	1
9a	418301	Motor AC 76w DLF	1
9b	418902	Fan D140x150 DLF	3
9c	418901	Fan housing 150 lower DLF	3
9d	418900	Fan housing 150 upper DLF	3

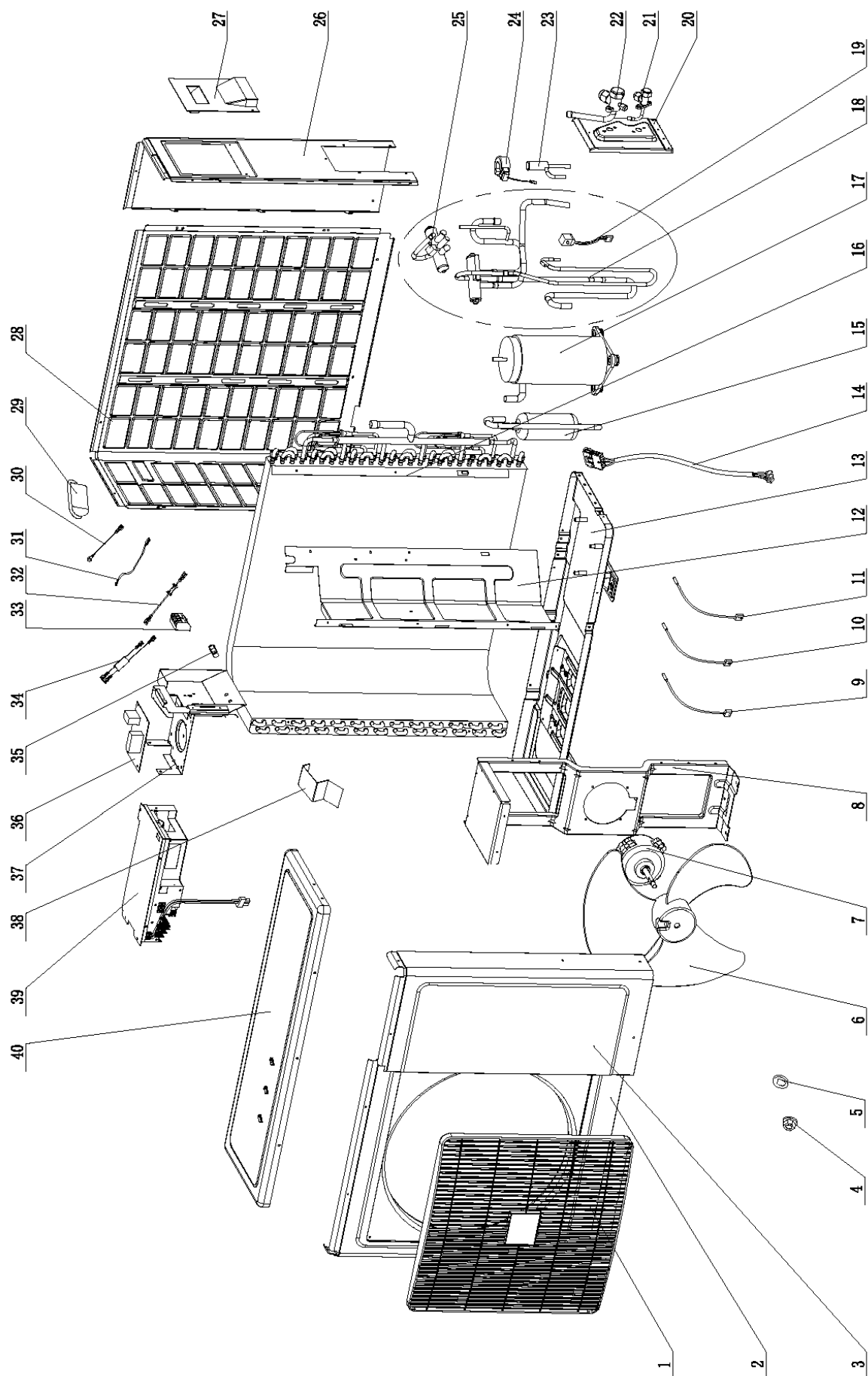
## 15.8 Outdoor Unit: DCI 50





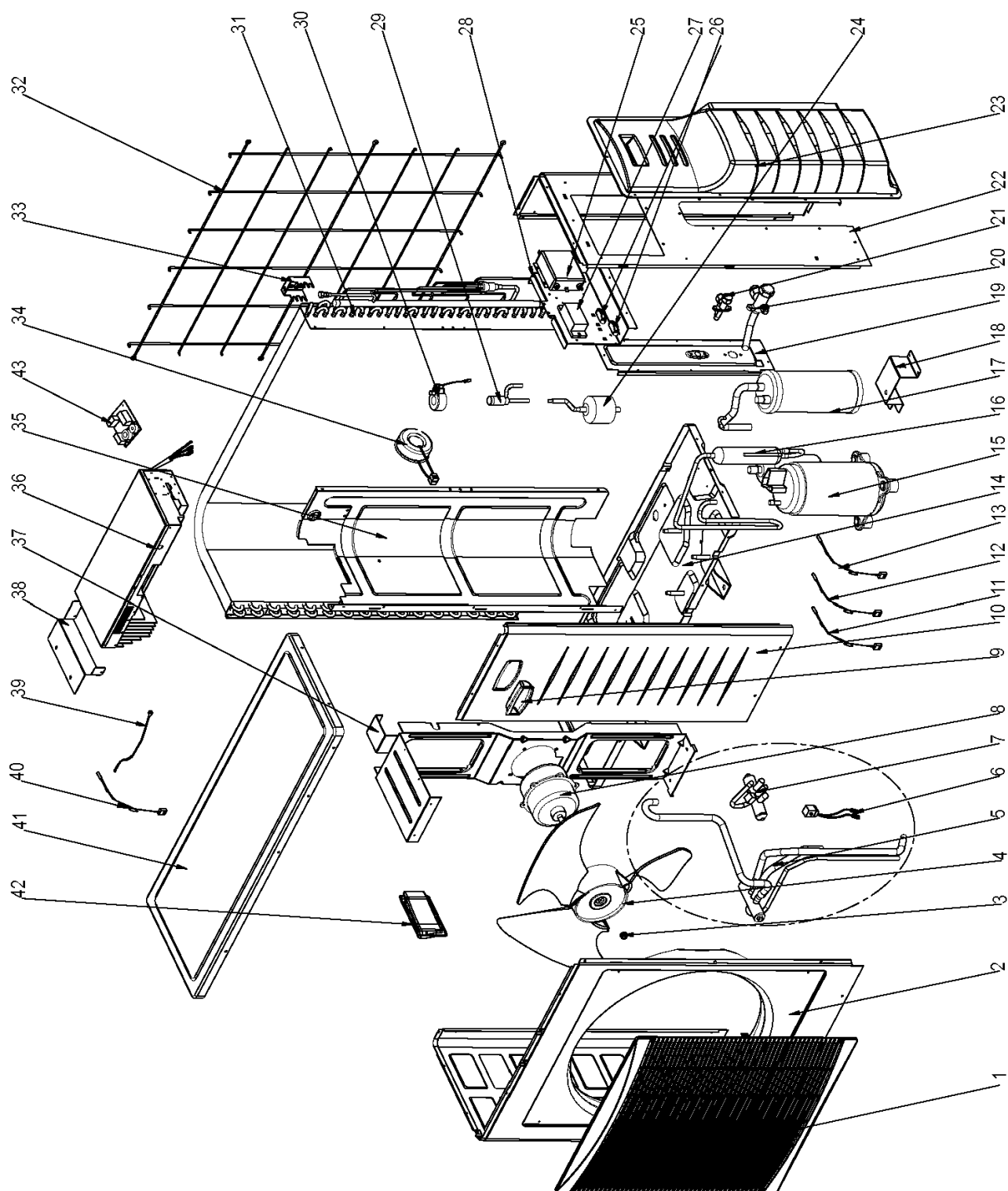
## 15.9 Outdoor Unit: DCI 50

No.	Part No.	Description	Unit
1	433218	Front panel A	1
2	4526340	Air inlet ring-420	1
3	433223	Painting insulation plate	1
4	4526476	Axial fan OD=401	1
5	4526475	DC motor for DCI 50	1
6	4526457	Motor support	1
7	4527363	Base painting Assy.	1
8	4526459	Partition	1
9	4526203	Outdoor DC inverter controller (English)	1
10	4524595	Gas valve (R410A)	1
11	4524176	Liquid valve(R410A)	1
12	4526224	EMI filter board 901-098-00	1
13	4526396	Chock Assy. 167-021-01	1
14	4526223	AC-IN connected wire	1
15	4526968	Earthing wire for DCI	1
16	4526222	Fuse connecting wire	1
17	4526300	Therminal sheet	1
18	4526220	Fuse stand JEF-511B(EHK P/N:150-038-00)	1
19	4526533	Fuse 65TS(20A,230)150-031-00	1
20	204107	Cable clip nylon	1
21	4519188	4 poles terminal block	1
22	433229	Value cover	1
23	4522509	4-Way valve coil	1
24	4527327	4-way valve welding Assy.	1
25	4518952	4-way valve	1
26	4526221	Compressor wire	1
27	4523446	DC Inverter compressor Assy. 5CS130XCC03	1
28	4526775	Compressor top thermistor(CTT)	1
29	4526774	Outside air thermistor(OAT)	1
30	4526776	Outside coil thermistor(OCT)	1
31	4526969	Suction coil thermistor(SUCT)	1
32	4526215	Electronic expansion valve ZDPF(L)-1.6C-01-RK for R410A	1
33	4526216	EEV COIL QA(L)12-HR-01A-RK	1
34	4519606	Right side panel	1
35	433228	Back side net	1
36	4526459	Condenser soldering assy	1
37	4526298	Bridge	1
38	4519614	Painting top cover	1
39	4526480	Gasket for axial fan	1
40	4519300	Nut M5 L	1
41	433225	Handle	1
42	4519607	Left side panel painting plate	1

**15.10 Outdoor Unit: DCI 60**

**15.11 Outdoor Unit: DCI 60**

No..	Item	Description	Quantity
1	4517144	FAN COVER PP+UV	1
2	452795700	PAINTED LEFT CABINET ASSY	1
3	4521642	Painted Right Cabinet and Isolation Assy.	1
4	4523141	M10 Hexagon locked nut M10	1
5	4526841	cusion for fan	1
6	4526510	FAN D=460mm (3 blade)	1
7	453026500	DC Motor SIC-71FW-F170-2	1
8	453036400	Motor Support	1
9	453238900	Sensor/OAT	1
10	4526775	Compressor top thermistor(CTT)	1
11	4526776	Outdoor coil thermistor(OCT)	1
12	453035800	Partition Plate	1
13	453036100	Base Plate Paint Assy.	1
14	4526221	Compressor wire	1
15	453041900	Liquid Accumulator	1
16	452882900	Condenser and distributor welding assy.	1
17	4523446	Liquid Accumulator	1
18	453034000	4-way Valve System Assy.	1
19	4522509	4-Way valve coil	1
20	4516766	PAINTED VALVE PLATE ASSY	1
21	4526301	High pressure stop valve R410a	1
22	4524595	1/2" Gas Valve for ONG R410A	1
23	4526215	Electronic expansion valve ZDPF(L)-1.6C-01-RK for R410A	1
24	4526216	EEV COIL QA(L)12-MD-02	1
25	4518952	4-W valve SHF-7H for R410A	1
26	4525938	PAINTED RIGHT-BACK CABINET ASSY	1
27	4523145	R.lifter	1
28	4517028	PAINTED LEFT-BACK GRILL	1
29	4516758	SMALL HANDLE	1
30	452841100	Earth wire	3
31	453238800	Ground Wire	1
32	453238700	Wire UL1007 16AWG/COM	1
33	4519188	4 poles terminal block	1
34	453238600	Wire 1015 16#/Power Input	1
35	204107	Cable clip Nylon	1
36	453048500	DCI 2.8kW EMI Filter Board 901-107-00	1
37	453052900	Therminal Plate Assy.	1
38	4526585	connect for motor bucket	1
39	453030500	Outdoor DCI Controller/2.8kW(English) 906-105-00	1
40	4516788	PAINTED TOP COVER ASSY	1

**15.12 Outdoor Unit: DCI 72Z**

**15.13 Outdoor Unit: DCI 72Z**

No.	Item	Description	Quan.
1	465100000	Grill/ DCI Trio	1
2	4523652	PAINTED LEFT CABINET ASSY	1
3	4523758	Nut M8 left	1
4	452960400	Outdoor Fan	1
5	461600023	4-Way Valve Assy.	1
6	4522509	4-way Valve Coil	1
7	4526522	FOUR-WAY VALVE R410A	1
8	466130002R	DC Motor 70W 8P	1
9	4522601	Right Handle	1
10	4523653	PAINTED RIGHT CABINET ASSY	1
11	4526775	Compressor Top Thermistor(CTT)	1
12	452956500	OMT Thermistor(OMT)	1
13	452677601	Outdoor Coil Thermistor(OCT)	1
14	452809900	Base Plate Painting Assy.	1
15	460080000R	Compressor Assy./ C-7RVN153H0W SANYO ShenYang)	1
16	452783600	Oil Separator Assy.	1
17	452783200	Liquid-gas Separator	1
18	453256100	Support Painting Support Assy./Gas-Liquid Separator	1
19	4526080	Valve plate paint assy	1
20	4526513	LOW PRESS VALVE (R410A)	1
21	4526514	Hight press valve(R410A)	1
22	4523654	PAINTED RIGHT BACK CABINET ASSY	1
23	4522602	Valve Cover	1
24	4518950	Filter Drier BFK-053S	1
26	204107	Cable clip Nylon	2
27	467420003	7 Poles Terminal Block	1
28	464280001	Terminal Plate/ DCI 72Z	1
29	4526215	Electronic expansion valve ZDPF(L)-1.6C-01-RK for R410A	1
30	4526216	EEV COIL QA(L)12-MD-02	1
31	462300002	Condenser Assy.	1
32	453175500	Guard Net Painting Assy.	1
33	453083800	Support/OAT	1
34	4526396	Choke Assy.167-021-01	1
35	464730006	Partition Plate Assy./DCI 72Z	1
36	467300082R	Controller/Outdoor Unit DCI 3.0KW(English) 906A-361-00	1
37	452888500	Motor Support	1
38	464250044	Connect Plate/Controller DCI 72Z	1
39	452841100	Earth wire	3
39	4516540	Earth wire	2
40	453238900	Sensor/OAT	1
41	4523657	PAINTED TOP COVER ASSY	1
42	4522600	Left Handle	1
43	467300114R	DCI 3.0KW EMI Fillter Board 901A-574-00	1

# APPENDIX A

## INSTALLATION AND OPERATION MANUAL

- ▶ REMOTE CONTROL RC3
- ▶ REMOTE CONTROL RC4
- ▶ REMOTE CONTROL RC7
- ▶ INSTALLATION AND OPERATION MANUAL DLF 25, 35, 50, 60, 72

# REMOTE CONTROL MANUAL

ENGLISH



## CONTENT

PRECAUTIONS .....1-2

USING THE REMOTE  
CONTROL UNIT .....3

OPERATION .....4-8



Before using your air-conditioner, please read this operating instruction carefully and keep it for future reference.

**Thank you for  
purchasing our  
Room Air Conditioner.**

468040071/01

# PRECAUTIONS

## DISPLAY

Information are displayed when the remote control unit is switched on.

### Operation Mode



Automatic Heating

Cooling Dehumidification (dry)

Fan only Displayed when data transmitted Or remote control unit lock

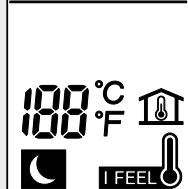


Displayed when the timer is set and activated.

Displayed when the timer on is set and activated

Clock (hours and minutes)

Displayed when the timer off is set and activated



Set temperature or room temperature

Displayed when the temperature is the room temperature

Displayed in Sleep Mode Operation

Indicate that the air conditioner is operating in I FEEL mode



Automatic supply air flap oscillation switched on



### Fan speed indication

Automatic fan speed

Low speed Medium speed High speed

### MODE SELECTOR BUTTON

Press this button to modify the air conditioner mode.

(automatic) ★

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the "cool" or "heat" mode.

(heating)

The air conditioner makes the room warmer.

dehumidification (dry)

The air conditioner reduces the humidity in the room.

(cooling)

The air conditioner makes the room cooler.

(fan)

The air conditioner circulate the air.

★ **COOL / DRY / HEAT / FAN Models**

### ROOM TEMPERATURE

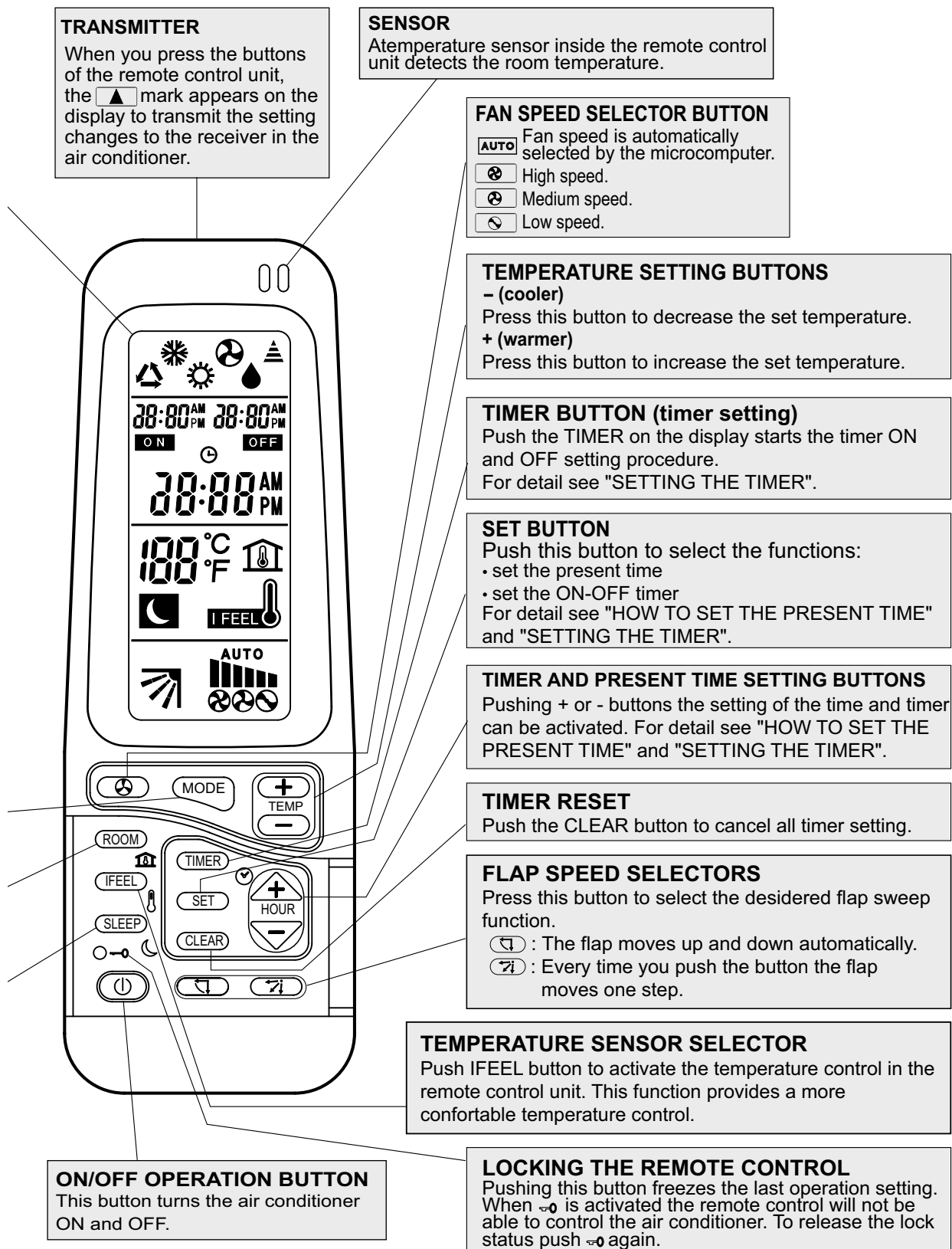
Push the ROOM button to show the actual room temperature around the remote control.

### SLEEP BUTTON

For details, see "Sleep mode".

When you press this button in the COOL, HEAT or DRY mode, the mark appears on the display and the microcomputer in the remote control unit will adjust the set temperature to save energy.





# USING THE REMOTE CONTROL UNIT

## HOW TO INSTALL BATTERIES

- Remove the lid in the rear part of the remote control unit.
- Insert two AAA alkaline batteries of 1,5 V-DC. Make sure the batteries point in the direction marked in the battery compartment.
- The batteries last about six months. Depending on how much you use the remote control unit. Remove the batteries if you do not use the remote control unit for more than one month. Press the +, -, SET and CLEAR buttons together after batteries replacement. (This operation allows you to reset correctly all the programs. The remote control unit is to be set up again).  
Replace the batteries when the remote control unit lamp fails to light, or when the air conditioner does not receive the remote control unit signals.
- The batteries of the remote control contain polluted substances exhausted batteries must be disposed according to the laws in force.

## TEMPERATURE SENSOR SELECTOR

- Under normal conditions the room temperature is detected and checked by the temperature sensor placed in the air conditioner.
- Press the remote control I FEEL button to activate the temperature sensor placed in the remote control. This function is designed to provide a personalised environment by transmitting the temperature control command from the location next to you. Therefore, in using this function, the remote control should always be aimed, without obstruction, at the air conditioner.

### NOTE

The remote control unit sends the temperature signal to the air conditioner regularly at two minute intervals. If the signal from the remote control unit stops for more than five minutes due to some troubles, the air conditioner will switch to the temperature sensor which is built into the indoor unit and controls the room temperature. In these cases, the temperature around the remote control unit may differ from the temperature detected in the air conditioner position.

## OPERATION WITH THE REMOTE CONTROL UNIT



**Caution**

Check that the circuit breaker on the power panel is turned ON and the STANDBY lamp is light up.

When using the remote control unit, always point the unit transmitter head directly at the air conditioner receiver.

## HOW TO TURN ON THE AIR CONDITIONER

Press the ON/OFF button to turn the air conditioner on. The indicator OPERATION will light up, indicating the unit is in operation.

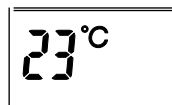


REMOTE CONTROL  
UNIT DISPLAY

# OPERATION

## HOW TO SET THE PRESENT TIME

1. Press the SET button for five seconds. The time indication alone flashes.
2. Press the + or - buttons until the present time is displayed.
3. Press the SET button to stop the indication flashing.



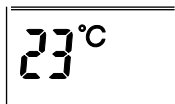
THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired (see adjustment of air flow). Make sure that the remote control is switched on.

## COOLING

Verify that the unit is connected to the main power and the STANDBY lamp is light up.

1. Set the MODE selector to COOL .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30°C max. and 16°C min.).



THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired (see adjustment of air flow). Make sure that the remote control is switched on.

## HEATING

1. Set the MODE selector to HEAT .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).

### NOTE

For several minutes after the start of heating operation, the indoor fan will not run until the indoor heat exchanger coil has warmed up sufficiently. This is because the COLD DRAFT PREVENTION SYSTEM is operating.

### • DEFROSTING OF HEAT EXCHANGE OUT DOOR UNIT "STANDBY"


When the outdoor temperature is low, frost or ice may appear on the heat exchanger coil, reducing the heating performance. When this happens, a microcomputer defrosting system operates. At the same time, the fan in the indoor unit stops and the OPERATION lamp is flashing until defrosting is completed. Heating operation restarts after several minutes. (This interval will vary slightly depending on the room and outdoor temperature).

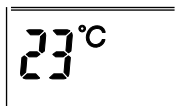
### • HEATING PERFORMANCE

A heat pump conditioner heats a room by taking heat from outside air. The heating efficiency will fall off when the outdoor temperature is very low. If enough heat is not obtained with this air conditioner, use another heating appliance in conjunction with it.

# OPERATION

## AUTOMATIC OPERATION


1. Set the MODE selector to AUTO .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).

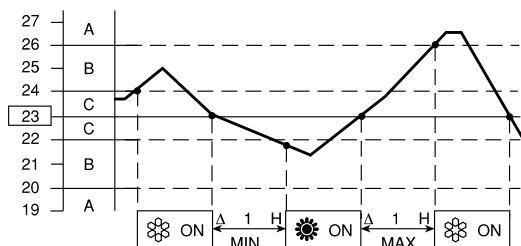


THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the COOL or HEAT mode as appropriate.

4. Switch the FAN SPEED selector button to the setting you want.

Example of operation diagram in the  (Auto) mode with the set room temperature at 23°C.




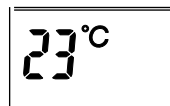
### NOTE

The air conditioner changes the operation mode (from cool to heat), if one of the following conditions occurs:

- **ZONE A:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 3°C..
- **ZONE B:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 1°C, one hour after the compressor stop.
- **ZONE C:** never changes if the difference between the room temperature and the temperature set on the remote control unit is no more than 1°C.

## DEHUMIDIFYING (DRY)

1. Set the MODE selector switch to "DRY" .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).




THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

### NOTE

- Use DRY operation when you want to reduce the humidity in the room.
- Once the room temperature reaches the set level, the unit repeats the cycle of turning on and off automatically.
- During DRY operation, the fan speed is automatically set to low or stops to prevent overcooling.
- Dry operation is not possible if the indoor temperature is 15 °C or less.

## FAN ONLY

If you want to make air circulate without any temperature control, follow these steps:

1. Set the MODE selector switch to "FAN" .
2. Press the ON/OFF button and switch the air conditioner ON.

# OPERATION

## ADJUSTING THE FAN SPEED

### • AUTOMATIC

Simply set the FAN SPEED selector to the **AUTO** position. A microcomputer automatically controls the fan speed when the AUTO mode is selected. When the air conditioner starts operating, the difference between the room temperature and the set temperature is detected by the microcomputer which then automatically switches the fan speed to the most suitable level.

### NOTE

In FAN Only mode the fan speed is adjusted automatically as in cooling mode.

WHEN DIFFERENCE BETWEEN ROOM TEMPERATURE AND SET TEMPERATURE IS		FAN SPEED
Cooling and dehumidifying modes:	2 °C and over	High
	Between 2 and 1 °C	Medium
	Below 1 °C	Low
Heating mode:	2 °C and over	High
	Below 2 °C	Medium

The above mentioned data make reference to the conditioner operating when the sensor on the remote control unit is ON. If the sensor on the indoor unit is being used then actual operation will slightly differ from that described in the above tables.

### • MANUAL


If you want to manually adjust speed just set the FAN SPEED selector as desired.

Each time the button is pressed, the fan speed is changed in sequence:

 (Lo) → 
  (Med) → 
  (Hi) → 
  (AUTO)

## SLEEP MODE

The SLEEP mode enables you to save energy.

1. Set the MODE selector to cool, dry or heat.
2. Press the SLEEP button.
3. The  mark appears on the display. Press the SLEEP button again to release the SLEEP function.

### What does the SLEEP mode mean?

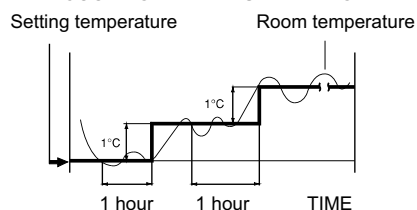


In this mode, the air conditioner will cool or heat the room to the set temperature, and then the thermostat will make the unit pause. After about 1 hour, the air conditioner will automatically reset the set temperature as follows (also refer to graphs).

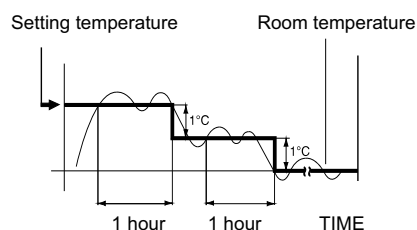
OPERATING MODE	SET TEMPERATURE CHANGE
Heating	Lowered by 1 °C
Cooling and Dehumidifying	Raised by 1 °C

When the room temperature reaches the new set value, the thermostat will cause the unit to pause. After about 1 hour the temperature will be raised by 1 °C in cooling, or lowered by 1 °C in heating. This enables you to save energy without sacrificing your comfort.

### COOLING AND DEHUMIDIFYING




### HEATING




# OPERATION

## I FEEL TEMP FUNCTION OPERATION

Press button IFEEL to activate the IFEEL function. Thermometer sign will appear on the LCD operation display . Select suitable temperature setting. Make sure that the remote control unit is aimed at the air conditioner, with the IFEEL sensor in front. Prevent the IFEEL sensor from being affected by heat sources such as lamps, heaters, direct sun, etc. or from being directly affected by the air conditioner air flow. These may cause the sensor to transmit the wrong temperature data, thereby disturbing the performance of the IFEEL function.

## ROOM TEMP FUNCTION OPERATION


Press the ROOM button to show the actual room temperature around the remote control unit. The measured room temperature and the room temperature sign  will be displayed. To cancel the ROOM Temperature display press on one of the following:

- Press again on ROOM Temperature button.
- Change of MODE button.

### NOTE

Room temperature range is between 6 and 36 in 1 increments. Display should show "HI" or "LO" to represent temperature that is above 36 or below 6.

## LOCK FUNCTION

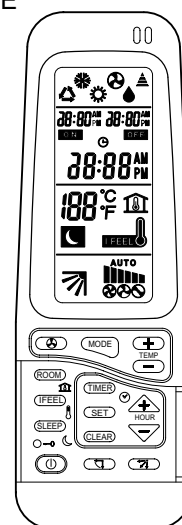
By pressing LOCK button, the remote control will lock the last operation program. All the function buttons will be inoperative, including START/STOP button. By pressing LOCK button again the remote control will be released from its locked position. When lock mode is functioning, the transmission sign  will be on.

## SETTING THE TIMER

Press button TIMER to activate the timer operation mode. Each time the TIMER button is pressed, one of the three types of operation modes will appear on the LCD display. Timer setting will not change until new setting is input.

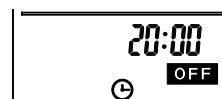
### A) HOW TO SET THE ON TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.



### B) HOW TO SET THE OFF TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the OFF sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.



### C) HOW TO SET A PROGRAM FOR DAILY ON/OFF OPERATION

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button again, the OFF sign blinks.
5. Press the + or - (HOUR) button until the desired value is displayed.
6. Press the SET button to activate the timer.



# OPERATION

## D) HOW TO CLEAR THE TIMER

1. Press the **TIMER** button to select the timer.
2. Press the **CLEAR** button if you want that every timer operation will be cleared.



### NOTE

If the procedure to set the timer is not completed, by pushing the **SET** button, within 15 seconds the timer operation will be cancelled and the last set-up is restored.



## ADJUSTING THE AIR FLOW DIRECTION

### HORIZONTAL (manual)

The horizontal air flow can be adjusted by moving the vertical vanes to the left or right, as indicated in the following figures.

### VERTICAL (with remote control unit)

The remote control gives you the possibility to control the flap in two way:

1. Push the  button to start the flap sweep. If you push again the flap stops immediately.
2. Push the  button to move the flap step by step.



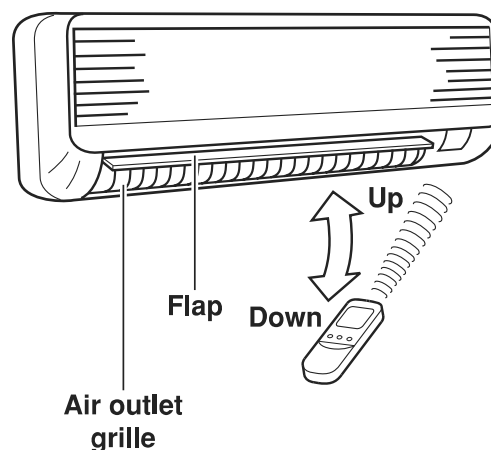
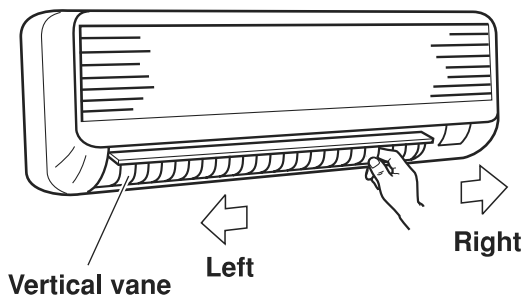
**Caution**

Set vertical vanes to the front position during **COOLING/DRY** operation if humidity is high. If the vertical vanes are set to the left-most or right-most position, condensation will form around the air outlet and drip off.



**Caution**

Do not move the flap with your hands when the air conditioner is running.



### NOTES

The flap automatically closes when the unit is off.

During the heating operation, the fan speed will be very low and the flap will be in the horizontal position until the air being blown out of the unit begins to warm. Once the air warms up, the flap position and fan speed change to the settings specified with the remote control.



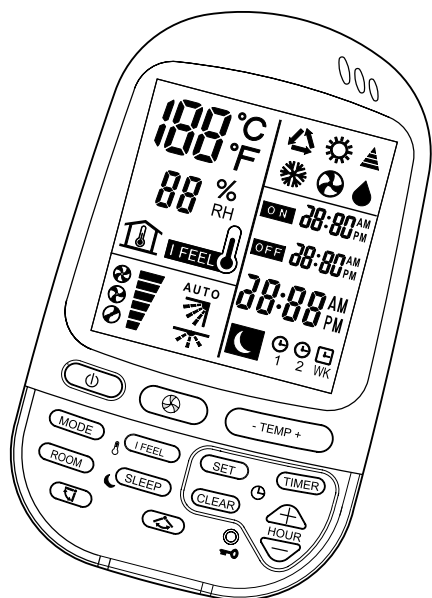
**Caution**

Use the **FLAP** button on the remote control to adjust the position of the flap. If you move the flap by hand, the factual flap position and the flap position on the remote control may no longer match. If this should happen, shut off the unit, wait for the flap to close, and then turn on the unit again; the flap position will now be normal again.

Do not have the flap pointed down during cooling operation. Condensation may begin to form around the air vent and drip down.

# REMOTE CONTROL MANUAL

ENGLISH



## CONTENT

PRECAUTIONS .....1-2

USING THE REMOTE  
CONTROL UNIT .....3

OPERATION .....4-10



Before using your air-conditioner, please read this operating instruction carefully and keep it for future reference.

**Thank you for  
purchasing our  
Room Air Conditioner.**

468040125/01



# PRECAUTIONS

## DISPLAY

Information are displayed when the remote control unit is switched on.

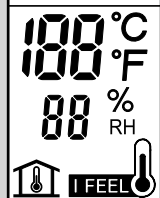
### Operation Mode



- Automatic
- Heating
- Cooling
- Fan only
- Dehumidification (dry)
- Displayed when data transmitted Or remote control unit lock



- Shows the type of timer
- Clock (hours and minutes)
- Displayed when the timer on is set and activated
- Displayed when the timer off is set and activated
- Displayed in Sleep Mode Operation



- Set temperature or room temperature
- Displayed when the temperature is the room temperature
- Indicate that the air conditioner is operating in I FEEL mode



- Automatic horizontal air flow oscillation switched on (option)
- Automatic flap oscillation switched on



### Fan speed indication

- Automatic fan speed
- Low speed
- Medium speed
- High speed

## ON/OFF OPERATION BUTTON

This button turns the air conditioner ON and OFF.

## MODE SELECTOR BUTTON

Press this button to modify the air conditioner mode.

(automatic) ★

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the "cool" or "heat" mode.

(heating)

The air conditioner makes the room warmer.

dehumidification (dry)

The air conditioner reduces the humidity in the room.

(cooling)

The air conditioner makes the room cooler.

(fan)

The air conditioner circulate the air.

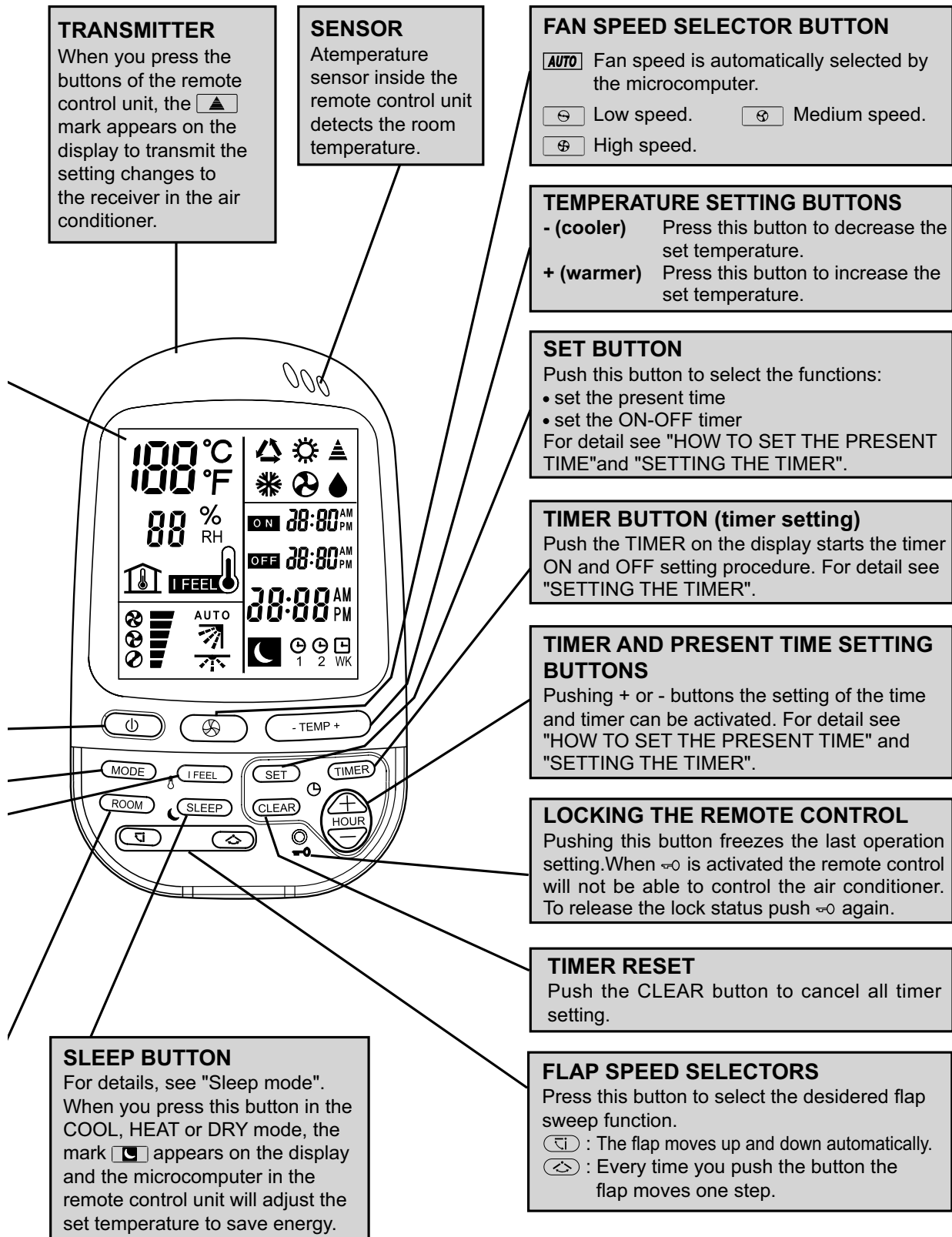
★ **COOL / DRY / HEAT / FAN Models**

## TEMPERATURE SENSOR SELECTOR

Push IFEEL button to activate the temperature control in the remote control unit. This function provides a more comfortable temperature control.

## ROOM TEMPERATURE

Push the ROOM button to show the actual room temperature around the remote control.



# USING THE REMOTE CONTROL UNIT

## HOW TO INSTALL BATTERIES

- Remove the lid in the rear part of the remote control unit.
- Insert two AAA alkaline batteries of 1,5 V-DC. Make sure the batteries point in the direction marked in the battery compartment.
- The batteries last about six months. Depending on how much you use the remote control unit. Remove the batteries if you do not use the remote control unit for more than one month. Press the +, -, SET and CLEAR buttons together after batteries replacement. (This operation allows you to reset correctly all the programs. The remote control unit is to be set up again).  
Replace the batteries when the remote control unit lamp fails to light, or when the air conditioner does not receive the remote control unit signals.
- The batteries of the remote control contain polluted substances exhausted batteries must be disposed according to the laws in force.

## TEMPERATURE SENSOR SELECTOR

- Under normal conditions the room temperature is detected and checked by the temperature sensor placed in the air conditioner.
- Press the remote control I FEEL button to activate the temperature sensor placed in the remote control. This function is designed to provide a personalised environment by transmitting the temperature control command from the location next to you. Therefore, in using this function, the remote control should always be aimed, without obstruction, at the air conditioner.

## OPERATION WITH THE REMOTE CONTROL UNIT



**Caution**

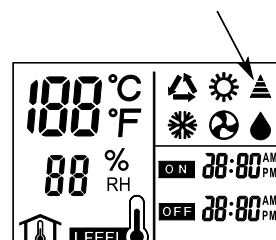
Check that the circuit breaker on the power panel is turned ON and the STANDBY lamp is light up. When using the remote control unit, always point the unit transmitter head directly at the air conditioner receiver.

## HOW TO TURN ON THE AIR CONDITIONER

Press the ON/OFF button to turn the air conditioner on. The indicator OPERATION will light up, indicating the unit is in operation.

## NOTE

The remote control unit sends the temperature signal to the air conditioner regularly at two minute intervals. If the signal from the remote control unit stops for more than five minutes due to some troubles, the air conditioner will switch to the temperature sensor which is built into the indoor unit and controls the room temperature. In these cases, the temperature around the remote control unit may differ from the temperature detected in the air conditioner position.



REMOTE CONTROL  
UNIT DISPLAY


# OPERATION

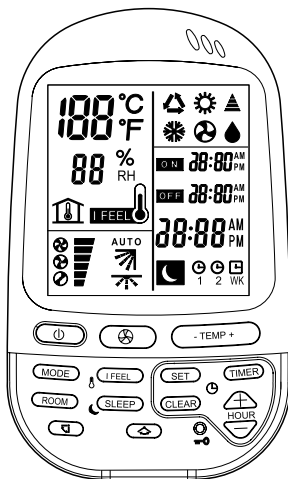
## HOW TO SET THE PRESENT TIME

1. Press the SET button for five seconds. The time indication alone flashes.
2. Press the + or - buttons until the present time is displayed.
3. Press the SET button to stop the indication flashing.

## COOLING

Verify that the unit is connected to the main power and the STANDBY lamp is light up.


1. Set the MODE selector to COOL .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30°C max. and 16°C min.).

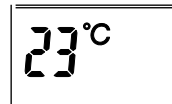


THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired(see adjustment of air flow). Make sure that the remote control is switched on.

## HEATING

1. Set the MODE selector to HEAT .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).



THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired(see adjustment of air flow). Make sure that the remote control is switched on.

### NOTE

For several minutes after the start of heating operation, the indoor fan will not run until the indoor heat exchanger coil has warmed up sufficiently. This is because the COLD DRAFT PREVENTION SYSTEM is operating.

### • DEFROSTING OF HEAT EXCHANGE OUT DOOR UNIT "STANDBY"


When the outdoor temperature is low, frost or ice may appear on the heat exchanger coil, reducing the heating performance. When this happens, a microcomputer defrosting system operates. At the same time, the fan in the indoor unit stops and the OPERATION lamp is flashing until defrosting is completed. Heating operation restarts after several minutes. (This interval will vary slightly depending on the room and outdoor temperature).

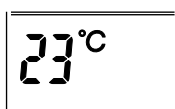
### • HEATING PERFORMANCE

A heat pump conditioner heats a room by taking heat from outside air. The heating efficiency will fall off when the outdoor temperature is very low. If enough heat is not obtained with this air conditioner, use another heating appliance in conjunction with it.

# OPERATION

## AUTOMATIC OPERATION


1. Set the MODE selector to AUTO .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).

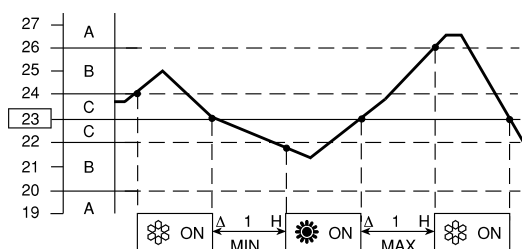


THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the COOL or HEAT mode as appropriate.

4. Switch the FAN SPEED selector button to the setting you want.

Example of operation diagram in the  (Auto) mode with the set room temperature at 23°C.




### NOTE

The air conditioner changes the operation mode (from cool to heat), if one of the following conditions occurs:

- **ZONE A:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 3°C..
- **ZONE B:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 1°C, one hour after the compressor stop.
- **ZONE C:** never changes if the difference between the room temperature and the temperature set on the remote control unit is no more than 1°C.

## DEHUMIDIFYING (DRY)

1. Set the MODE selector switch to "DRY" .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).




THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

### NOTE

- Use DRY operation when you want to reduce the humidity in the room.
- Once the room temperature reaches the set level, the unit repeats the cycle of turning on and off automatically.
- During DRY operation, the fan speed is automatically set to low or stops to prevent overcooling.
- Dry operation is not possible if the indoor temperature is 15 °C or less.

## FAN ONLY

If you want to make air circulate without any temperature control, follow these steps:

1. Set the MODE selector switch to "FAN" .
2. Press the ON/OFF button and switch the air conditioner ON.

# OPERATION

## ADJUSTING THE FAN SPEED

### • AUTOMATIC

Simply set the FAN SPEED selector to the **AUTO** position. A microcomputer automatically controls the fan speed when the AUTO mode is selected. When the air conditioner starts operating, the difference between the room temperature and the set temperature is detected by the microcomputer which then automatically switches the fan speed to the most suitable level.

### NOTE

In FAN Only mode the fan speed is adjusted automatically as in cooling mode.





WHEN DIFFERENCE BETWEEN ROOM TEMPERATURE AND SET TEMPERATURE IS		FAN SPEED
Cooling and dehumidifying modes:	2 °C and over	High
	Between 2 and 1 °C	Medium
	Below 1 °C	Low
Heating mode:	2 °C and over	High
	Below 2 °C	Medium

The above mentioned data make reference to the conditioner operating when the sensor on the remote control unit is ON. If the sensor on the indoor unit is being used then actual operation will slightly differ from that described in the above tables.

### • MANUAL


If you want to manually adjust speed just set the FAN SPEED selector as desired.

Each time the button is pressed, the fan speed is changed in sequence:

 (Lo) → 
  (Med) → 
  (Hi) → 
  (AUTO)

## SLEEP MODE

The SLEEP mode enables you to save energy.

1. Set the MODE selector to cool, dry or heat.
2. Press the SLEEP button.
3. The  mark appears on the display. Press the SLEEP button again to release the SLEEP function.

### What does the SLEEP mode mean?

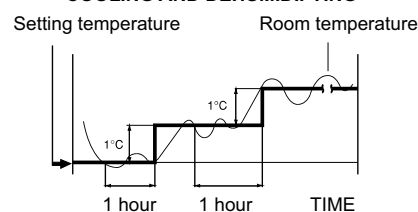


In this mode, the air conditioner will cool or heat the room to the set temperature, and then the thermostat will make the unit pause. After about 1 hour, the air conditioner will automatically reset the set temperature as follows (also refer to graphs).

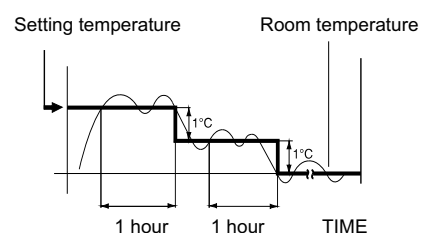
OPERATING MODE	SET TEMPERATURE CHANGE
Heating	Lowered by 1 °C
Cooling and Dehumidifying	Raised by 1 °C

When the room temperature reaches the new set value, the thermostat will cause the unit to pause. After about 1 hour the temperature will be raised by 1 °C in cooling, or lowered by 1 °C in heating. This enables you to save energy without sacrificing your comfort.

### COOLING AND DEHUMIDIFYING




### HEATING




# OPERATION

## I FEEL TEMP FUNCTION OPERATION

Press button IFEEL to activate the IFEEL function. Thermometer sign will appear on the LCD operation display . Select suitable temperature setting. Make sure that the remote control unit is aimed at the air conditioner, with the IFEEL sensor in front. Prevent the IFEEL sensor from being affected by heat sources such as lamps, heaters, direct sun, etc. or from being directly affected by the air conditioner air flow. These may cause the sensor to transmit the wrong temperature data, thereby disturbing the performance of the IFEEL function.

## ROOM TEMP FUNCTION OPERATION


Press the ROOM button to show the actual room temperature around the remote control unit. The measured room temperature and the room temperature sign  will be displayed. To cancel the ROOM Temperature display press on one of the following:

- Press again on ROOM Temperature button.
- Change of MODE button.

### NOTE

Room temperature range is between 6 and 36 in 1 increments. Display should show "HI" or "LO" to represent temperature that is above 36 or below 6.

## LOCK FUNCTION

By pressing LOCK button, the remote control will lock the last operation program. All the function buttons will be inoperative, including START/STOP button. By pressing LOCK button again the remote control will be released from its locked position. When lock mode is functioning, the transmission sign  will be on.

## SETTING THE TIMER

There are four timers that can be selected on the remote control. Two daily timers (designated as T1, T2), and two optional weekend timers (designated as WKT1, WKT2). Each timer can be selected by pressing TIMER button.

The daily timers T1 and T2 can be set for ON and OFF separately for two different time periods. Timer setting will not change until new setting is input.

The weekend timers WKT1 and WKT2 can be set for ON and OFF separately for two different time periods and they are effective two days only. These timers will be effective on the day of setting and on the day after only.

At 24:00 on the second day, the WK timer will not be effective anymore and the daily timer will be effective again.

WKT1 - effective on the setting day

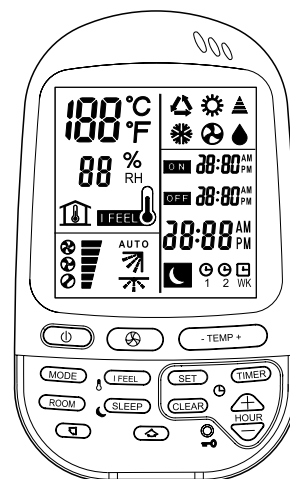
WKT2 - effective one day after the setting day.

### NOTE:

1. During the weekend timer operation, the daily timers will be disabled.
2. The WK timers must be reactivated before every weekend.

### A) HOW TO SET THE ON TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.



# OPERATION

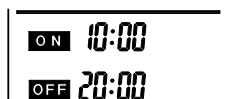
## B) HOW TO SET THE OFF TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the OFF sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.



## C) HOW TO SET A PROGRAM FOR DAILY ON/OFF OPERATION

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button again, the OFF sign blinks.
5. Press the + or - (HOUR) button until the desired value is displayed.
6. Press the SET button to activate the timer.



## D) HOW TO CLEAR THE TIMER

1. Press the TIMER button to select the timer.
2. Press the CLEAR button if you want that every timer operation will be cleared.



### NOTE

If the procedure to set the timer is not completed, by pushing the SET button, within 15 seconds the timer operation will be cancelled and the last set-up is restored.

## ADJUSTING THE AIR FLOW DIRECTION

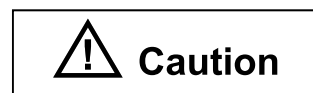
### HORIZONTAL (manual)

The horizontal air flow can be adjusted by moving the vertical vanes to the left or right, as indicated in the following figures.

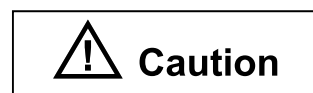
### VERTICAL (with remote control unit)

The remote control gives you the possibility to control the flap in two way:

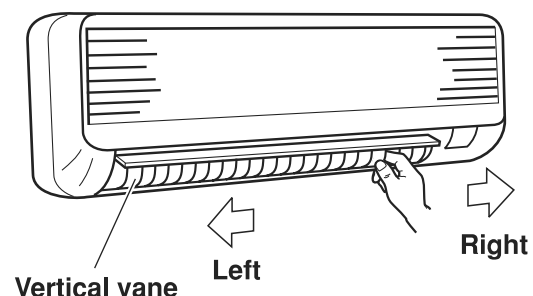
1. Push the button to start the flap sweep. If you push again the flap stops immediately.
2. Push the button to move the flap step by step. Or activate the horizontal air flow option is selectable via switch.



Set vertical vanes to the front position during COOLING/DRY operation if humidity is high. If the vertical vanes are set to the left-most or right-most position, condensation will form around the air outlet and drip off.



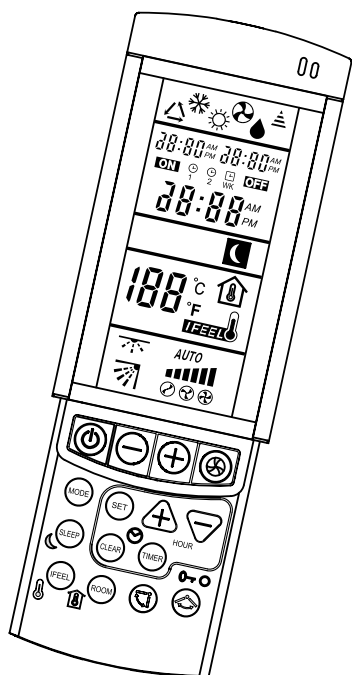
Do not move the flap with your hands when the air conditioner is running.





# REMOTE CONTROL MANUAL

ENGLISH



## CONTENT

PRECAUTIONS .....1-2

USING THE REMOTE  
CONTROL UNIT .....3

OPERATION .....4-9



Before using your air-conditioner, please read this operating instruction carefully and keep it for future reference.

**Thank you for  
purchasing our  
Room Air Conditioner.**

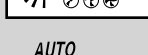
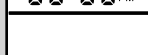
468040197/01

# PRECAUTIONS

## DISPLAY

Information are displayed when the remote control unit is switched on.

### Operation Mode



- Automatic
- Heating
- Cooling
- Fan only
- Dehumidification (dry)
- Displayed when data transmitted Or remote control unit lock
- Shows the type of timer
- Clock (hours and minutes)
- ON
- Displayed when the timer on is set and activated
- OFF
- Displayed when the timer off is set and activated
- Displayed in Sleep Mode Operation
- Set temperature or room temperature
- Displayed when the temperature is the room temperature
- Indicate that the air conditioner is operating in I FEEL mode
- Automatic horizontal air flow oscillation switched on (option)
- Automatic flap oscillation switched on

### Fan speed indication

- Automatic fan speed
- Low speed
- Medium speed
- High speed

## ON/OFF OPERATION BUTTON

This button turns the air conditioner ON and OFF.

## MODE SELECTOR BUTTON

Press this button to modify the air conditioner mode.

(automatic) ★

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the "cool" or "heat" mode.

(heating)

The air conditioner makes the room warmer.

dehumidification (dry)

The air conditioner reduces the humidity in the room.

(cooling)

The air conditioner makes the room cooler.

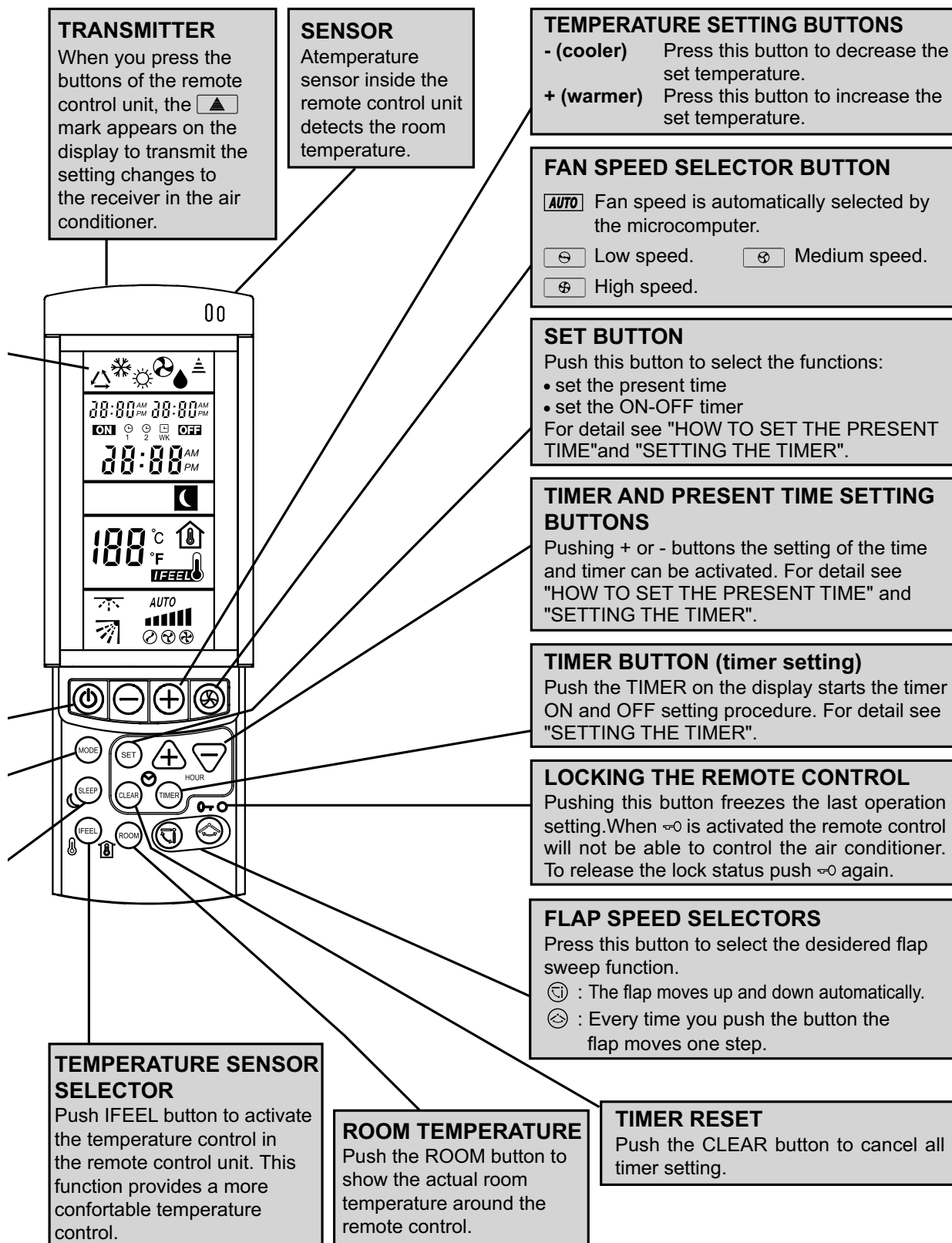
(fan)

The air conditioner circulate the air.

★ **COOL / DRY / HEAT / FAN Models**

## SLEEP BUTTON

For details, see "Sleep mode". When you press this button in the COOL, HEAT or DRY mode, the mark appears on the display and the microcomputer in the remote control unit will adjust the set temperature to save energy.



# USING THE REMOTE CONTROL UNIT

## HOW TO INSTALL BATTERIES

- Remove the lid in the rear part of the remote control unit.
- Insert two AAA alkaline batteries of 1,5 V-DC. Make sure the batteries point in the direction marked in the battery compartment.
- The batteries last about six months. Depending on how much you use the remote control unit. Remove the batteries if you do not use the remote control unit for more than one month. Press the +, -, SET and CLEAR buttons together after batteries replacement. (This operation allows you to reset correctly all the programs. The remote control unit is to be set up again).  
Replace the batteries when the remote control unit lamp fails to light, or when the air conditioner does not receive the remote control unit signals.
- The batteries of the remote control contain polluted substances exhausted batteries must be disposed according to the laws in force.

## TEMPERATURE SENSOR SELECTOR

- Under normal conditions the room temperature is detected and checked by the temperature sensor placed in the air conditioner.
- Press the remote control I FEEL button to activate the temperature sensor placed in the remote control. This function is designed to provide a personalised environment by transmitting the temperature control command from the location next to you. Therefore, in using this function, the remote control should always be aimed, without obstruction, at the air conditioner.

## NOTE

The remote control unit sends the temperature signal to the air conditioner regularly at two minute intervals. If the signal from the remote control unit stops for more than five minutes due to some troubles, the air conditioner will switch to the temperature sensor which is built into the indoor unit and controls the room temperature. In these cases, the temperature around the remote control unit may differ from the temperature detected in the air conditioner position.

## OPERATION WITH THE REMOTE CONTROL UNIT



**Caution**

Check that the circuit breaker on the power panel is turned ON and the STANDBY lamp is light up. When using the remote control unit, always point the unit transmitter head directly at the air conditioner receiver.

## HOW TO TURN ON THE AIR CONDITIONER

Press the ON/OFF button to turn the air conditioner on. The indicator OPERATION will light up, indicating the unit is in operation.



REMOTE CONTROL  
UNIT DISPLAY


# OPERATION

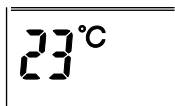
## HOW TO SET THE PRESENT TIME

1. Press the SET button for five seconds. The time indication alone flashes.
2. Press the + or - buttons until the present time is displayed.
3. Press the SET button to stop the indication flashing.

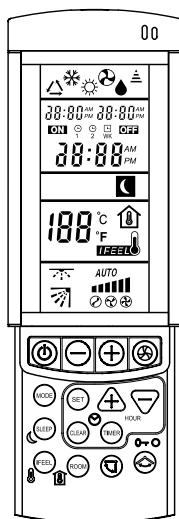
## COOLING

Verify that the unit is connected to the main power and the STANDBY lamp is light up.

1. Set the MODE selector to COOL .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30°C max. and 16°C min.).




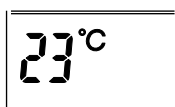
THE DISPLAY SHOWS THE SELECTED TEMPERATURE.



4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired (see adjustment of air flow). Make sure that the remote control is switched on.

## HEATING

1. Set the MODE selector to HEAT .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).



THE DISPLAY SHOWS THE SELECTED TEMPERATURE.

4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired (see adjustment of air flow). Make sure that the remote control is switched on.

### NOTE

For several minutes after the start of heating operation, the indoor fan will not run until the indoor heat exchanger coil has warmed up sufficiently. This is because the COLD DRAFT PREVENTION SYSTEM is operating.

### • DEFROSTING OF HEAT EXCHANGE OUT DOOR UNIT "STANDBY"


When the outdoor temperature is low, frost or ice may appear on the heat exchanger coil, reducing the heating performance. When this happens, a microcomputer defrosting system operates. At the same time, the fan in the indoor unit stops and the OPERATION lamp is flashing until defrosting is completed. Heating operation restarts after several minutes. (This interval will vary slightly depending on the room and outdoor temperature).

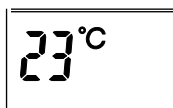
### • HEATING PERFORMANCE

A heat pump conditioner heats a room by taking heat from outside air. The heating efficiency will fall off when the outdoor temperature is very low. If enough heat is not obtained with this air conditioner, use another heating appliance in conjunction with it.

# OPERATION

## AUTOMATIC OPERATION


1. Set the MODE selector to AUTO .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).

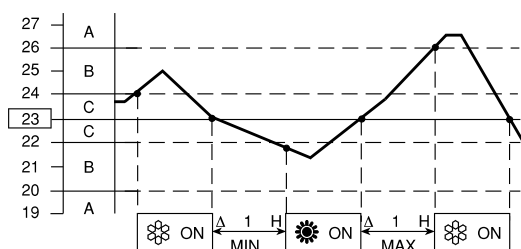


THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the COOL or HEAT mode as appropriate.

4. Switch the FAN SPEED selector button to the setting you want.

Example of operation diagram in the  (Auto) mode with the set room temperature at 23°C.




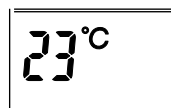
### NOTE

The air conditioner changes the operation mode (from cool to heat), if one of the following conditions occurs:

- **ZONE A:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 3°C..
- **ZONE B:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 1°C, one hour after the compressor stop.
- **ZONE C:** never changes if the difference between the room temperature and the temperature set on the remote control unit is no more than 1°C.

## DEHUMIDIFYING (DRY)

1. Set the MODE selector switch to "DRY" .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).




THE DISPLAY SHOWS THE  
SELECTED TEMPERATURE.

### NOTE

- Use DRY operation when you want to reduce the humidity in the room.
- Once the room temperature reaches the set level, the unit repeats the cycle of turning on and off automatically.
- During DRY operation, the fan speed is automatically set to low or stops to prevent overcooling.
- Dry operation is not possible if the indoor temperature is 15 °C or less.

## FAN ONLY

If you want to make air circulate without any temperature control, follow these steps:

1. Set the MODE selector switch to "FAN" .
2. Press the ON/OFF button and switch the air conditioner ON.

# OPERATION

## ADJUSTING THE FAN SPEED

### • AUTOMATIC

Simply set the FAN SPEED selector to the **AUTO** position. A microcomputer automatically controls the fan speed when the AUTO mode is selected. When the air conditioner starts operating, the difference between the room temperature and the set temperature is detected by the microcomputer which then automatically switches the fan speed to the most suitable level.

### NOTE

In FAN Only mode the fan speed is adjusted automatically as in cooling mode.

WHEN DIFFERENCE BETWEEN ROOM TEMPERATURE AND SET TEMPERATURE IS		FAN SPEED
Cooling and dehumidifying modes:	2 °C and over	High
	Between 2 and 1 °C	Medium
	Below 1 °C	Low
Heating mode:	2 °C and over	High
	Below 2 °C	Medium

The above mentioned data make reference to the conditioner operating when the sensor on the remote control unit is ON. If the sensor on the indoor unit is being used then actual operation will slightly differ from that described in the above tables.

### • MANUAL


If you want to manually adjust speed just set the FAN SPEED selector as desired.

Each time the button is pressed, the fan speed is changed in sequence:

☺ (Lo) → ☺☺ (Med) → ☺☺☺ (Hi) →  (AUTO)

## SLEEP MODE

The SLEEP mode enables you to save energy.

1. Set the MODE selector to cool, dry or heat.
2. Press the SLEEP button.
3. The  mark appears on the display. Press the SLEEP button again to release the SLEEP function.

### What does the SLEEP mode mean?

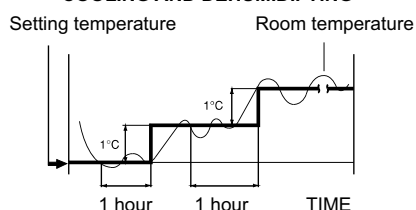


In this mode, the air conditioner will cool or heat the room to the set temperature, and then the thermostat will make the unit pause. After about 1 hour, the air conditioner will automatically reset the set temperature as follows (also refer to graphs).

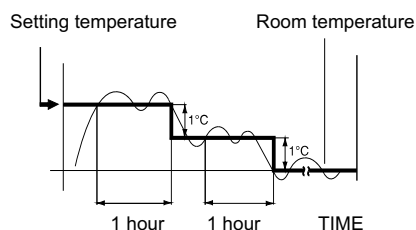
OPERATING MODE	SET TEMPERATURE CHANGE
Heating	Lowered by 1 °C
Cooling and Dehumidifying	Raised by 1 °C

When the room temperature reaches the new set value, the thermostat will cause the unit to pause. After about 1 hour the temperature will be raised by 1 °C in cooling, or lowered by 1 °C in heating. This enables you to save energy without sacrificing your comfort.

### COOLING AND DEHUMIDIFYING




### HEATING




# OPERATION

## I FEEL TEMP FUNCTION OPERATION

Press button IFEEL to activate the IFEEL function. Thermometer sign will appear on the LCD operation display . Select suitable temperature setting. Make sure that the remote control unit is aimed at the air conditioner, with the IFEEL sensor in front. Prevent the IFEEL sensor from being affected by heat sources such as lamps, heaters, direct sun, etc. or from being directly affected by the air conditioner air flow. These may cause the sensor to transmit the wrong temperature data, thereby disturbing the performance of the IFEEL function.

## ROOM TEMP FUNCTION OPERATION


Press the ROOM button to show the actual room temperature around the remote control unit. The measured room temperature and the room temperature sign  will be displayed. To cancel the ROOM Temperature display press on one of the following:

- Press again on ROOM Temperature button.
- Change of MODE button.

### NOTE

Room temperature range is between 6 and 36 in 1 increments. Display should show "HI" or "LO" to represent temperature that is above 36 or below 6.

## LOCK FUNCTION

By pressing LOCK button, the remote control will lock the last operation program. All the function buttons will be inoperative, including START/STOP button. By pressing LOCK button again the remote control will be released from its locked position. When lock mode is functioning, the transmission sign  will be on.

## SETTING THE TIMER

There are four timers that can be selected on the remote control. Two daily timers (designated as T1, T2), and two optional weekend timers (designated as WKT1, WKT2). Each timer can be selected by pressing TIMER button.

The daily timers T1 and T2 can be set for ON and OFF separately for two different time periods. Timer setting will not change until new setting is input.

The weekend timers WKT1 and WKT2 can be set for ON and OFF separately for two different time periods and they are effective two days only. These timers will be effective on the day of setting and on the day after only.

At 24:00 on the second day, the WK timer will not be effective anymore and the daily timer will be effective again.

WKT1 - effective on the setting day

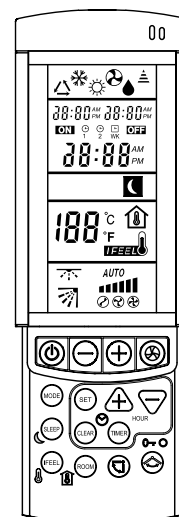
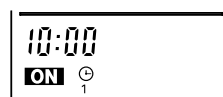
WKT2 - effective one day after the setting day.

### NOTE:

1. During the weekend timer operation, the daily timers will be disabled.
2. The WK timers must be reactivated before every weekend.

### A) HOW TO SET THE ON TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.



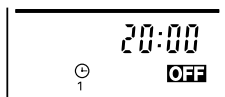
### B) HOW TO SET THE OFF TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the OFF sign blinks.



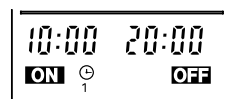
# OPERATION

3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.



## C) HOW TO SET A PROGRAM FOR DAILY ON/OFF OPERATION

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button again, the OFF sign blinks.
5. Press the + or - (HOUR) button until the desired value is displayed.
6. Press the SET button to activate the timer.



## D) HOW TO CLEAR THE TIMER

1. Press the TIMER button to select the timer.
2. Press the CLEAR button if you want that every timer operation will be cleared.



### NOTE

If the procedure to set the timer is not completed, by pushing the SET button, within 15 seconds the timer operation will be cancelled and the last set-up is restored.

## ADJUSTING THE AIR FLOW DIRECTION

### HORIZONTAL (manual)

The horizontal air flow can be adjusted by moving the vertical vanes to the left or right, as indicated in the following figures.

### VERTICAL (with remote control unit)

The remote control gives you the possibility to control the flap in two way:

1. Push the button to start the flap sweep. If you push again the flap stops immediately.
2. push the button to move the flap step by step. Or activate the horizontal air flow option is selectable via switch.

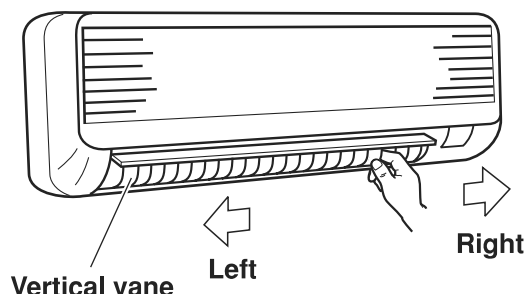


Set vertical vanes to the front position during COOLING/DRY operation if humidity is high.

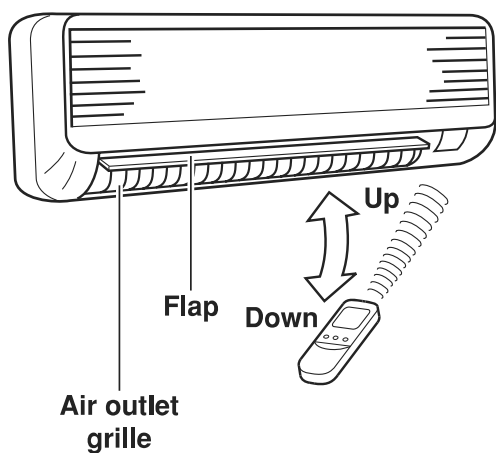
If the vertical vanes are set to the left-most or right-most position, condensation will form around the air outlet and drip off.



Do not move the flap with your hands when the air conditioner is running.



## OPERATION



### Caution

Use the FLAP button on the remote control to adjust the position of the flap. If you move the flap by hand, the factual flap position and the flap position on the remote control may no longer match. If this should happen, shut off the unit, wait for the flap to close, and then turn on the unit again; the flap position will now be normal again.

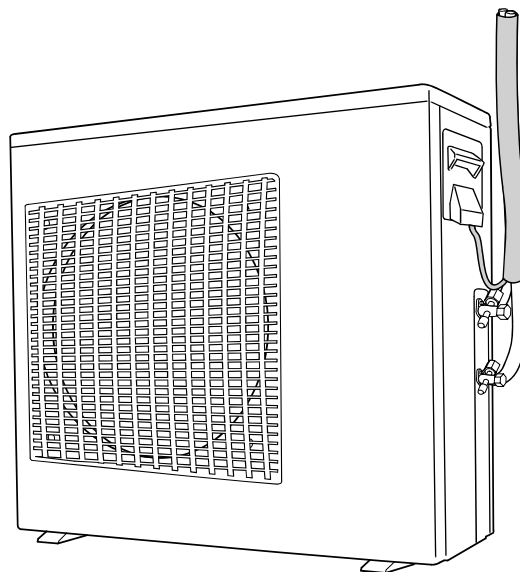
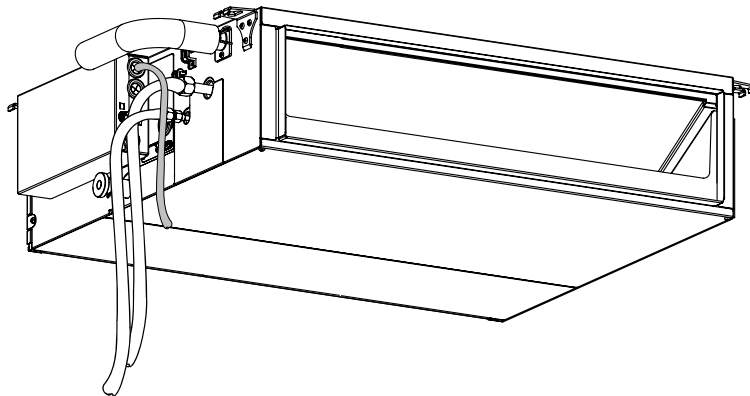
Do not have the flap pointed down during cooling operation. Condensation may begin to form around the air vent and drip down.

### NOTES

The flap automatically closes when the unit is off.

During the heating operation, the fan speed will be very low and the flap will be in the horizontal position until the air being blown out of the unit begins to warm. Once the air warms up, the flap position and fan speed change to the settings specified with the remote control.

# CONCEALED AIR CONDITIONER WITH ELECTRONIC CONTROL SERIES LSN DCI



## INSTALLATION INSTRUCTIONS

## Getting Started...

### REQUIRED TOOLS LIST

- |   |                                    |                   |
|---|------------------------------------|-------------------|
| 1. Screw driver                               | 8. Gas leak detector               | 15. Torque wrench |
| 2. Electric drill,<br>hole core drill (60 mm) | 9. Measuring tape                  | 18 Nm (1.8 kgf.m) |
| 3. Hexagonal wrench                           | 10. Thermometer                    | 45 Nm (4.5 kgf.m) |
| 4. Spanner                                    | 11. Megameter                      | 65 Nm (6.5 kgf.m) |
| 5. Pipe cutter                                | 12. Multimeter                     | 75 Nm (7.5 kgf.m) |
| 6. Reamer                                     | 13. Vacuum pump                    | 85 Nm (8.5 kgf.m) |
| 7. Knife                                      | 14. Gauge manifold<br>(for R-410A) |                   |

### ATTENTION

- Selection of the units location.  
Select a location, which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.
- Do not release refrigerant during piping work for installation, reinstallation and during repairing a refrigeration parts.  
Take care of the liquid refrigerant, it may cause frostbite.
- Installation work. It may need two people to carry out the installation work.
- Do not install this appliance in a laundry room or humid ambient where water may drip from the ceiling, etc.

### Contents:

Installation/Service Tooling .....	4	<b>Pipes connections</b> .....	15
Attached Accessories .....	6	Cutting and flaring .....	15
<b>General information</b> .....	7	Pipe insulation .....	15
<b>General precautions</b> .....	9	Pipe connections to the unit .....	16
<b>Indoor unit</b> .....	10	Evacuation of pipes and indoor unit .....	16
Access to the unit .....	10	<b>Electrical connections</b> .....	17
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<b>Outdoor unit</b> .....	14		
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Several outdoors installation .....	14		
Disposal of outdoor unit condensed water .....	15		

## SAFETY PRECAUTIONS

Read the following "SAFETY PRECAUTIONS" carefully before installation. Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed. The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below.

Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

Carry out test running to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

**The items to be followed are classified by the symbols:**



**WARNING**

This indication shows the possibility of causing death or serious injury.


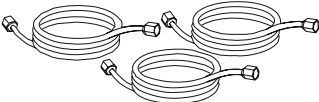






Symbol with background white denotes item that is **PROHIBITED** from doing.



### WARNING

1. Use qualified installer and follow careful this instructions, otherwise it will cause electrical shock, water leakage, or aesthetic problem.
2. Install at a strong and firm location, which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
3. For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough it will cause electrical shock or fire.
4. Use the specified cable and connect tightly for indoor/outdoor connection. Connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.
5. Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.
6. Before obtaining access to terminals, all supply circuits must be disconnected.
7. When carrying out piping connection, take care not to let air substances other than the specified refrigerant go into refrigeration cycle, otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion and injury.
8. Do not damage or use unspecified power supply cord. Otherwise, it will cause fire or electrical shock.
9. Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.
10. This equipment must be earthed. It may cause electrical shock if grounding is not perfect.
11. Do not install the unit at place where leakage of flammable gas may occur. Incase of gas leaks and accumulates at surrounding of the unit, it may cause fire.
12. Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
13. If supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Installation/Service Tooling for R410A		Changes
Gauge manifold		As the working pressure is high, it is impossible to measure the working pressure using conventional gauges. In order to prevent any other refrigerant from being charged, the port diameters have been changed.
Charge hose		In order to increase pressure resisting strength, hose materials and port sizes have been changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to confirm the port size.
Electronic scale for refrigerant charging		As working pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.
Torque wrench (nominal dia. 1/2, 5/8)		The size of opposing flare nuts has been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.
Flare tool (clutch type)		By increasing the clamp bar's receiving hole size, strength of spring in the tool has been improved.
Gauge for projection adjustment		Used when flare is made by conventional flare tool.
Vacuum pump adapter & check valve		Connected to a conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back into the charge hose. The charge hose connecting part has two ports - one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A. If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment.
Gas leakage detector		Exclusive for HFC refrigerant.

*Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U.S's ARI specified rose color (ARI color code: PMS 507). Also, the "charge port and packing for refrigerant cylinder" requires 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.*

**CAUTION R410A Air Conditioner Installation**

THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER. R410A refrigerant is apt to be affected by impurities such as water, oxidizing membrane, and oils because the working pressure of R410A refrigerant is approx. 1.6 times of refrigerant R22. Accompanied with the adoption of the new refrigerant, the refrigeration machine oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigeration machine oil does not enter into the new type refrigerant R410A air conditioner circuit. To prevent mixing of refrigerant or refrigerating machine oil, the sizes of connecting sections of charging port on main unit and installation tools are different from those used for the conventional refrigerant units. Accordingly, special tools are required for the new refrigerant (R410A) units. For connecting pipes, use new and clean piping materials with high pressure fittings made for R410A only.

Moreover, do not use the existing piping because there are some problems with pressure fittings and possible impurities in existing piping.

**Changes in the product and components**

In air conditioners using R410A, in order to prevent any other refrigerant from being accidentally charged, the service port diameter size of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch). In order to increase the pressure resisting strength of the refrigerant piping, flare processing diameter and opposing flare nuts sizes have been changed. (for copper pipes with nominal dimensions 1/2 and 5/8).













In case of pipes welding please make sure to use dry Nitrogen inside the pipes.

Use copper tube of special thickness for R410A:

1/4"-1/2" 0.8 mm

5/8"-3/4" 1 mm

Do not vent **R410A** into atmosphere: **R410A** is a fluorinated greenhouse gas, covered by Kyoto Protocol, with a Global Warming Potential (GWP) = **1730**

ATTACHED ACCESSORIES			
Description	Amount	Name	Use
	1	Technician's installation manual	Installation instructions
	1	Instruction manual for remote control	Operation instructions for remote
	1	Instruction manual for unit display	Operation instructions
	1	Remote control including batteries	Operating the air-conditioner
	1	Remote control bracket	Hanging the remote control on the wall
	1	Central control display	Operating and main working display
	4	Rubber mounting pads	Padding of the outdoor unit
	4	Tie-Wraps	Tightening the indoor and the outdoor units electrical cables
	4 each	Dibbles - Screws - Washers	Installing bracket for remote control and central control display
	1	Drain elbow	Connecting drain hose to outdoor
	1	Drain tube + clips	Connecting drain hose to indoor
	1+1	Gas tubing insulation	Additional insulation on both gas connections



## GENERAL INFORMATION

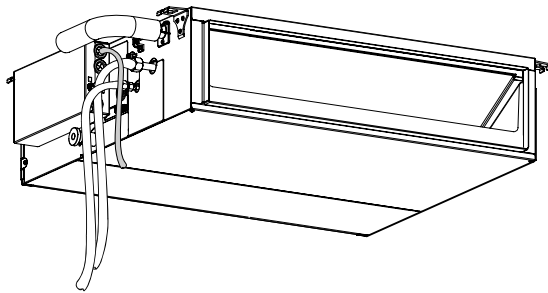
## Indoor Unit

The unit can be installed as concealed unit above a false ceiling or as vertical floor mounted.

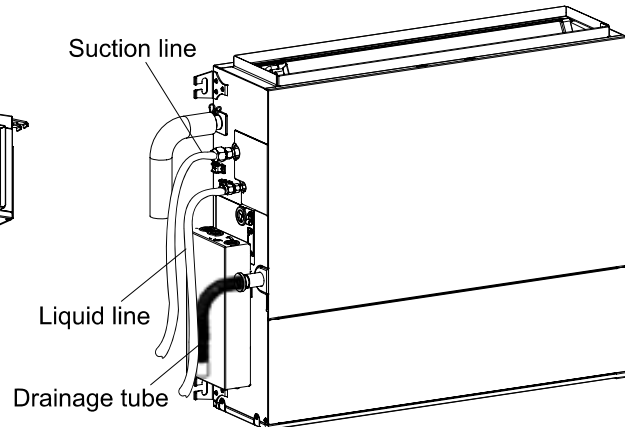
Since the unit is a concealed and not a ducted unit, it is very important that the ducts length will fit the maximum external static pressure allowed in the table in page 9.

**For vertical installation, refer to the special instructions in drainage and electrical connection chapters.**

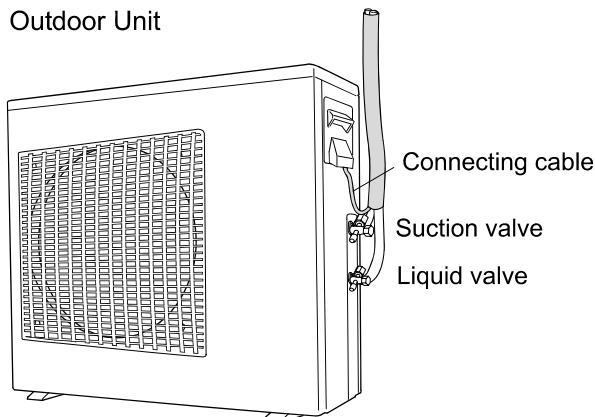
Horizontal Installation



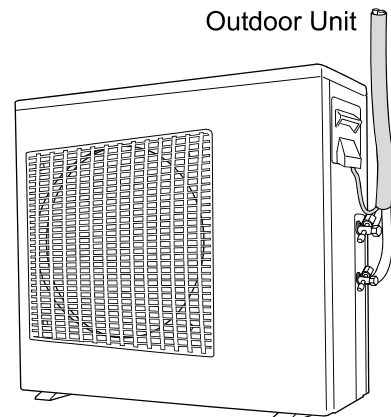
Vertical Installation



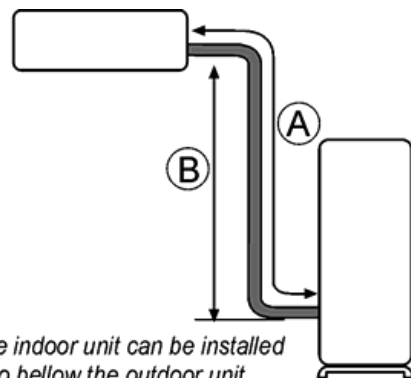
Outdoor Unit



Outdoor Unit

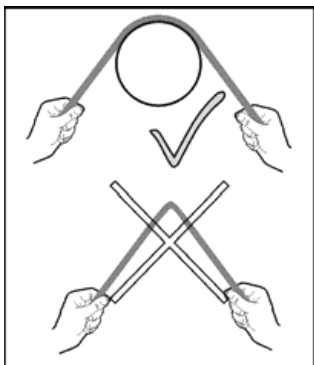


MAXIMUM PIPES LENGTH & HEIGHT			
NOMINAL CAPACITY	TUBES O.D	LENGTH (A)	HEIGHT (B)
2.5kW	1/4"-3/8"	20	10
3.5kW	1/4"-3/8"	20	10
5kW	1/4"-1/2"	30	15
6kW	1/4"-1/2"	30	15
7.2kW	3/8"-5/8"	50	25

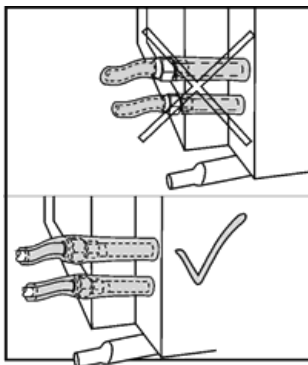


EXTERNAL STATIC PRESSURE		
NOMINAL CAPACITY	NOMINAL	MAX
2.5kW	10	30
3.5kW	10	30
5kW	10	40
6kW	10	40
7.2kW	10	40

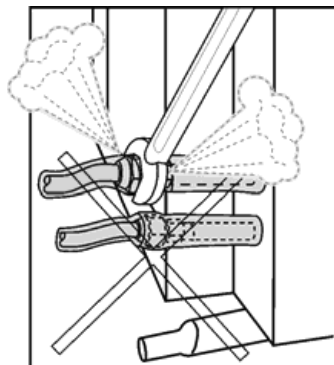
## GENERAL PRECAUTIONS



Always use the support of a large radius cylinder for banding the tubes, using pipe bending tools



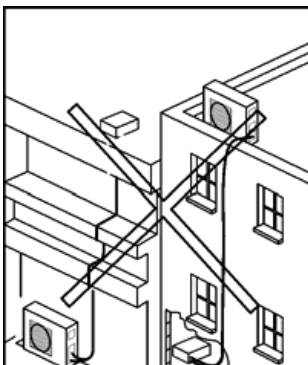
Do not leave nuts of gas tubes uncovered. Isolate the connections with the supplied tube insulation



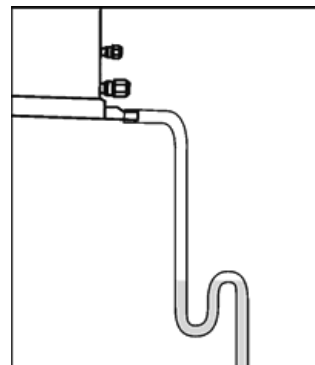
Do not untie gas tubes after installation



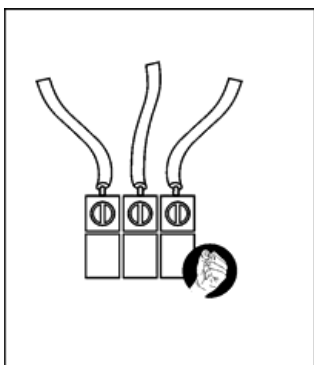
Avoid placing the indoor unit near water or oily mist



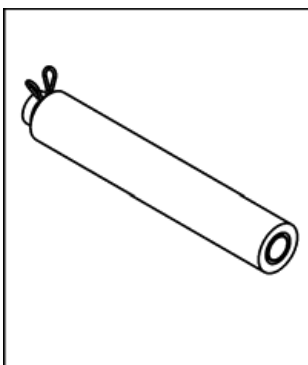
Avoid pipes bending and keep pipes as short as possible, minimum 3 meters



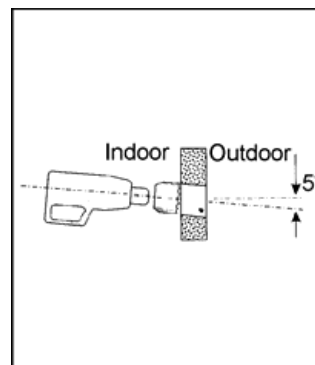
Making of a water trap (Siphon) will prevent bad odors



Tighten electrical circuits cables



Insulate drainage tube



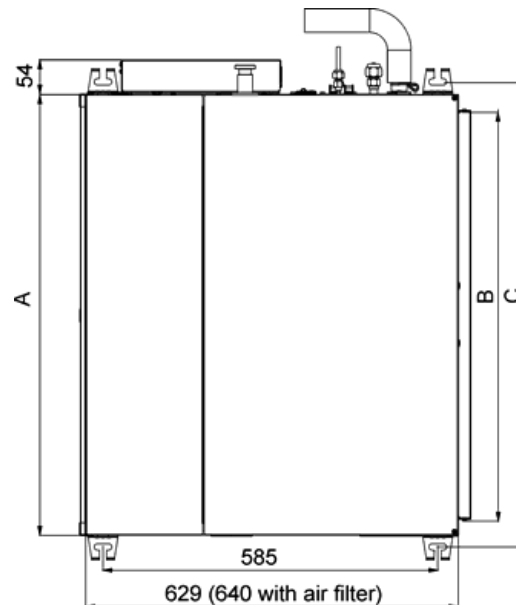
Drill the hole at an angle to prevent condensed or rain water from penetrating back into the room

## INDOOR UNIT

### UNIT LOCATION

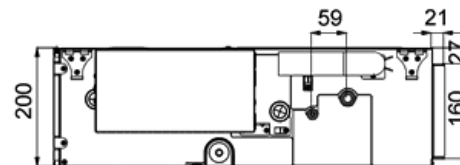
- While selecting a place for the indoor unit:
- Allow max. air flow to the desired space.
  - Allow max return air flow.
  - Ensure adequate drainage of condensed water.
  - Ensure noise reduction near bedrooms.
  - Leave a minimum 200 mm free space in the rear side of the unit.
  - Allow a free service access to electrical box.
  - Allow easy access to the base of the indoor unit while providing enough space from the ceiling.
  - Use serrated rubber under the unit and flexible joints to avoid resonance vibrations.

### UNIT DIMENSIONS

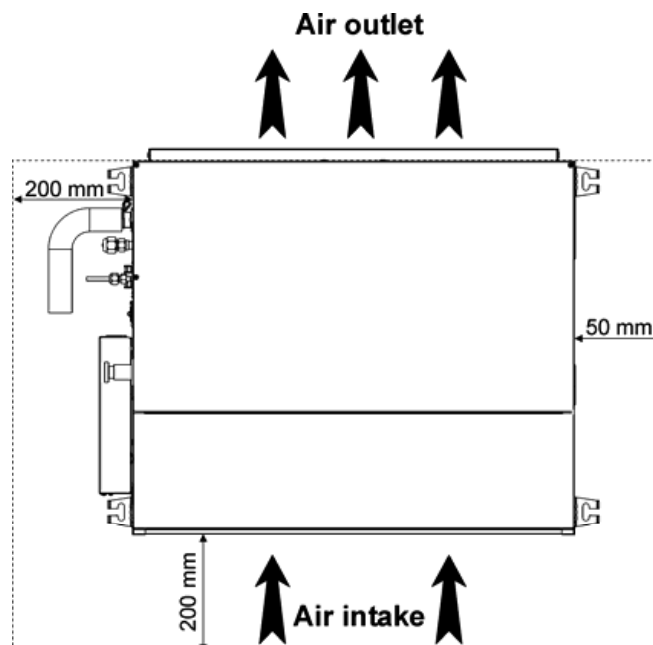


### UNIT DIMENSIONS

NOMINAL CAPACITY	A	B	C
2.5-5kW	750	696	790
6-7.2kW	1050	996	1090



## CLEARANCES AROUND THE UNIT AND SERVICE ACCESS

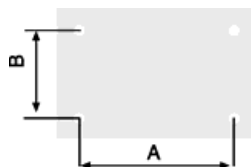


## UNIT INSTALLATION

- Insert 4 M10 or 3/8" threads rods into the ceiling.
- Introduce the rods through the slots of unit suspension brackets.
- Position the shock absorbers, add washers and screw the nuts until the unit is firmly supported.
- In case of a gap between the unit and the ceiling, put a rubber or a neoprene sheet.

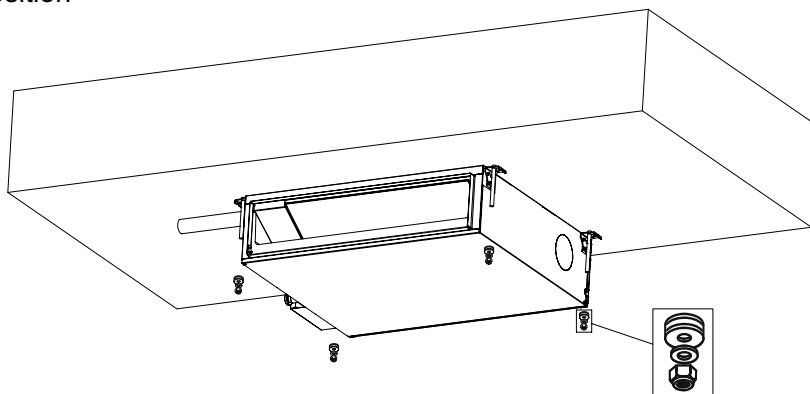
**IMPORTANT** The unit must be perfectly leveled

## HOLES DRILLING LOCATION ON THE CEILING FOR INDOOR UNIT

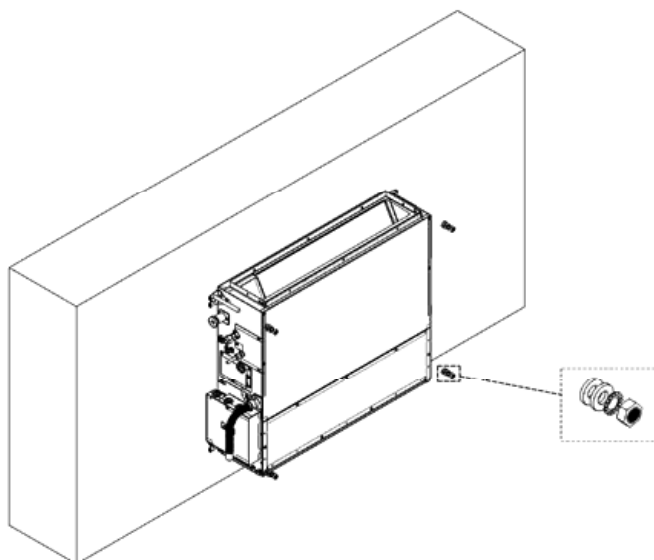


NOMINAL CAPACITY	A	B
2.5-5kW	790	565
6.72kW	1090	565

Horizontal position



Vertical position

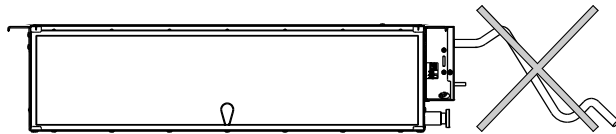
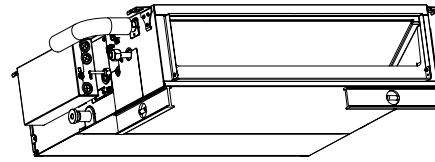


## DRAINAGE INSTALLATION

### General

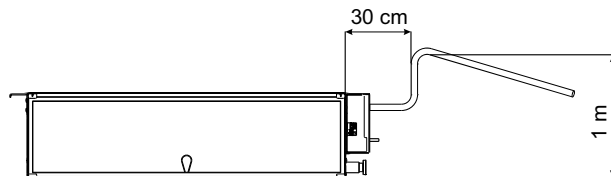
For an efficient functioning of the drainage system, please take care of the following:

- Always balance the unit with 2° downward to the drainage side of the unit.
- Use 19 mm tube drainage.
- It is recommended to prepare a drainage point by professional plumber close to the unit.
- For proper drainage, the passage must be planned with 1° down slope.
- Prevent any upwards or reverse flow in any part.
- For preventing of unpleasant smells in the room, install a siphon in the installation.
- Install the draining tube with 6 mm thickness thermal insulation sleeve.



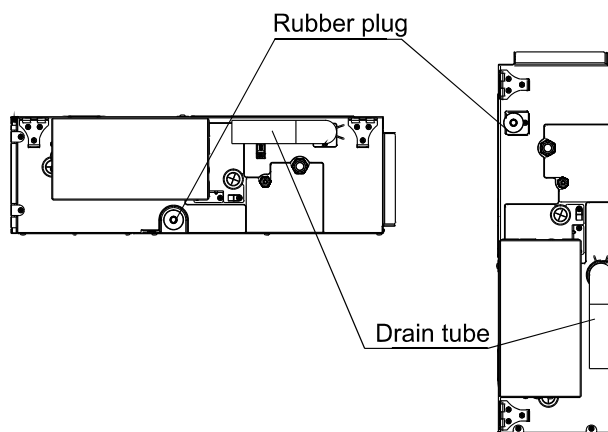
### Horizontal drainage

- The unit includes a drain pump, which can elevate condensate water up to 120 cm from the unit lowest level. The drainage tube is connected to the upper drainage nozzle.
- The lower drainage nozzle role is to empty the drain pan before servicing the unit.
- Install on the drain tube with 5-10 mm thickness thermal insulation sleeve to prevent drippings.



### Drainage in vertical installation

- For vertical installation the water pump and float switch operation must be canceled, refer to instructions in electrical connection chapter.
- Replace the drain tube location with the rubber plug.

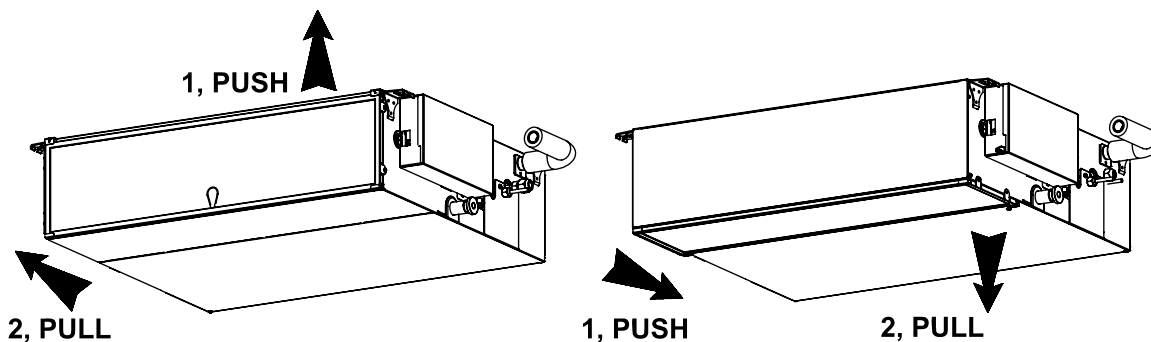


### AIR FILTER LOCATION

The air filter is located in the rear side of the unit (default from factory) but can be easily relocated in the bottom of the unit if it is required. For vertical installation, it is recommended to relocate the filter in front of the unit.

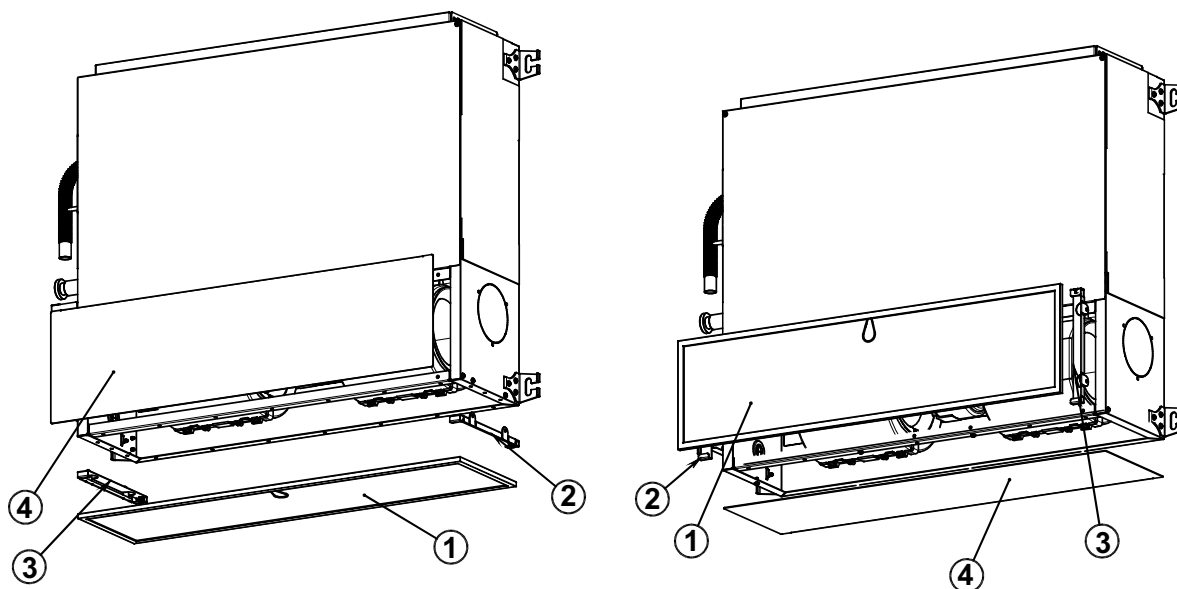
### AIR FILTER CLEANING

For cleaning the filter remove it by pushing up toward the back of the unit and pull it out as described bellow.



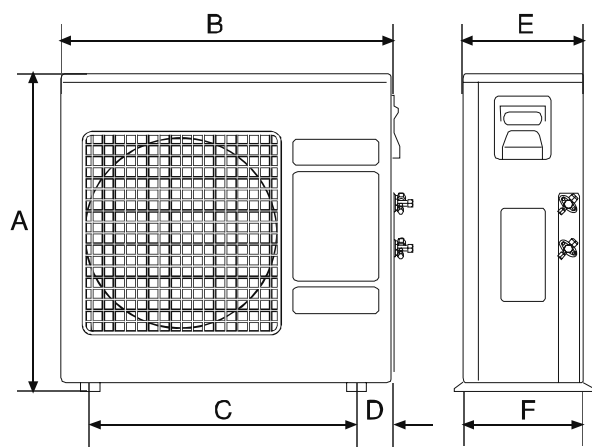
### AIR FILTER RELOCATION

1. Remove air filter from the unit.
2. Remove panel 4.
3. Remove filter trails 2-3.
4. Insert filter trails 2-3 on the opposite side of the unit.
5. Close panel 4 in the rear side of the unit.
6. Insert the filter into the trails.



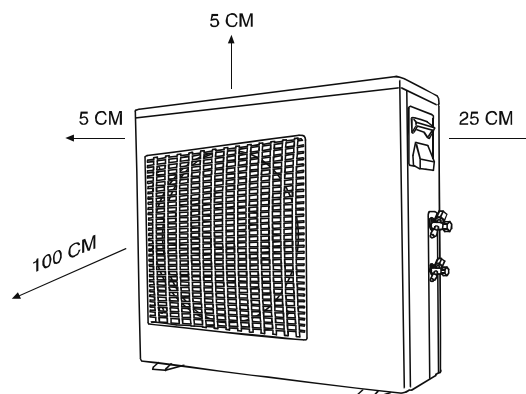
## OUTDOOR UNIT

### UNIT DIMENSIONS



NOMINAL CAPACITY	A	B	C	D	E	F
2.5-5.0kW	610	795	500	148	290	293
6kW	690	846	545	152	302	330
7.2kW	864	950	527	212	340	378

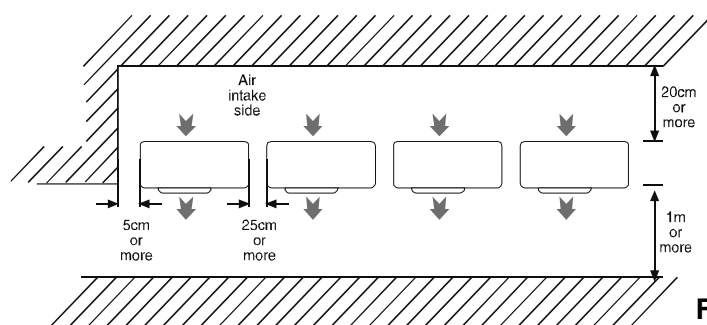
### CLEARANCES AROUND THE UNIT



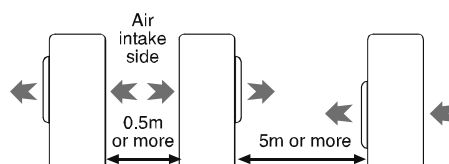
## SEVERAL OUTDOORS INSTALLATION

When installing several outdoors units please take into account the air flow around the units and follow the minimum distance suggestions as shown in the diagrams bellow.

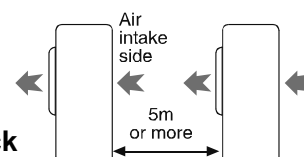
### Row Installation



### Back to Back Front to Front



### Front to Back



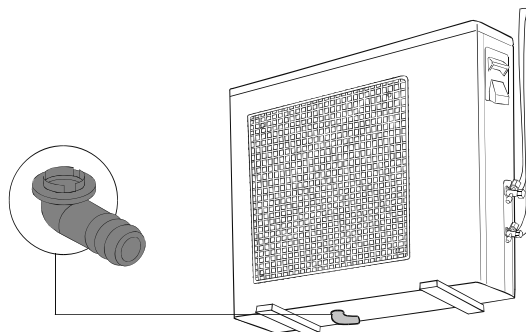


### DISPOSAL OF OUTDOOR UNIT CONDENSED WATER

In case of using a drain elbow, the unit should be placed on a stand at least 3 cm high.

Install the hose with a downward to allow smooth flow of draining water.

Use 16mm I.D. tube for drainage.



### PIPES CONNECTIONS

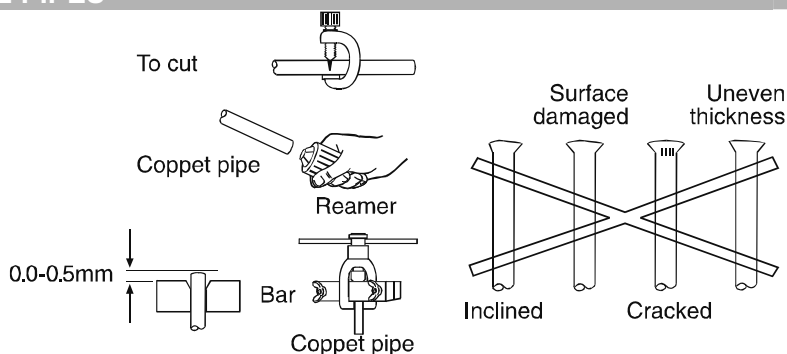
#### CUTTING AND FLARING THE PIPES

1. Please use the pipe cutter for cutting the pipes.

2. Remove all burrs by using reamer. Gas leakage might happen if burrs are not removed !

Turn pipes edge down to avoid metal powder from entering down the pipes.

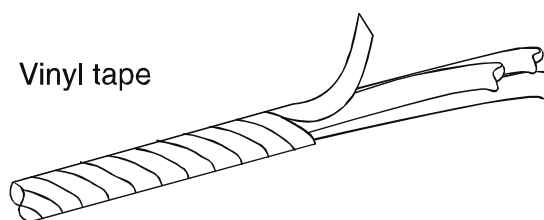
3. After inserting the flare nut into the copper pipes, please make a flare.



#### PIPE INSULATION

1. Please carry out insulation at pipe connection portion as mentioned in Indoor/ Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.

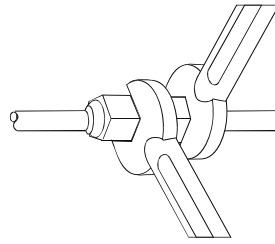
2. If drain hose or connecting pipes is in the room (where dew may form). Please increase the insulation by using POLY-E FOAM with thickness of 9 mm or more.



## PIPE CONECTIONS TO THE UNIT

### Connecting to the indoor unit

1. Align the center of the pipes and finger tight the flare nut.
2. Use the torque wrench to tighten the nut firmly.



### Connecting to the outdoor unit

1. Align the center of the pipes to the valves.
2. Use the torque wrench to tighten the valves firmly according to table:

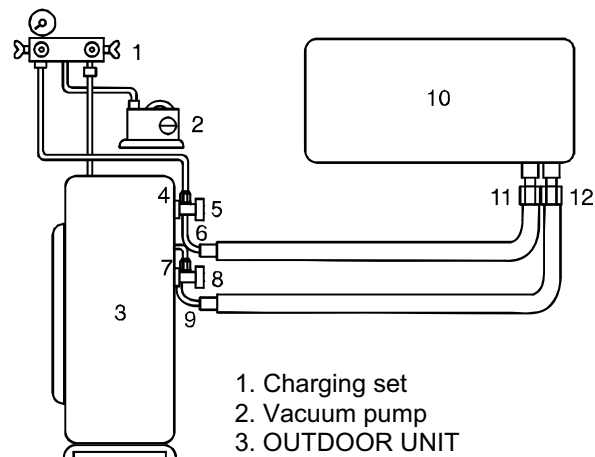
Tube (Inch)/ Torque(N.m)	1/4	3/8	1/2	5/8	3/4
Flare Nuts	13-18	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

## EVACUATION OF PIPES AND INDOOR UNIT

After connection the unions of the indoor and outdoor units, evacuate the air from the tubes and from the indoor unit as follows:

1. Connect the charging hoses with a push pin to the low and high sides of the charging set and the service port of the suction and liquid valves. Be sure to connect the end of the charging hose with the push pin to the service port.
2. Connect the center hose of the charging set to a vacuum pump.
3. Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0MPa (0cm Hg) to - 0.1 Mpa (-76cm Hg). Let the pump run for fifteen minutes.
4. Close the valves of both the low and high sides of the charging set and turn off the vacuum pump. Note that the needle in the gauge should not move after approximately five minutes.
5. Disconnect the charging hose from the vacuum pump and from the service ports of the suction and liquid valves.
6. Tighten the service port caps from both valves, and open them using a hexagonal Allen wrench.
7. Remove the valve caps from both valves, and open them using a hexagonal Allen wrench.
8. Remount valve caps onto both of the valves.
9. Check for gas leaks from the four unions and from the valve caps.

Test with electronic leak detector or with a sponge immersed in soapy water for bubbles.



1. Charging set
2. Vacuum pump
3. OUTDOOR UNIT
4. Service valve
5. Cap
6. Suction valve
7. Service valve\*
8. Cap
9. Liquid valve
10. INDOOR UNIT
11. Suction flare connection
12. Liquid flare connection

Sample

CHARGE SET AND ADDITIONAL CHARGE FOR VARIOUS APPLICATIONS

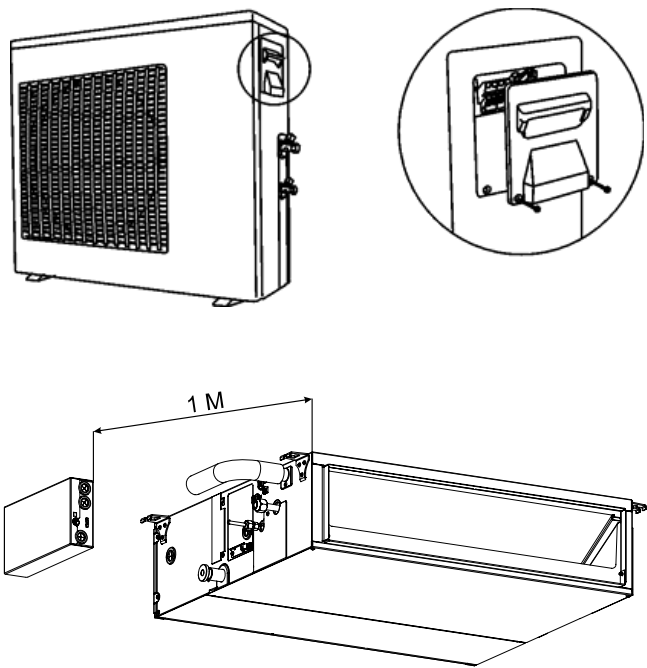
PIPE SIZE	W/CHARGE	W/CHARGE	W/CHARGE	W/CHARGE
1/4"	1.25	1.25	1.25	1.25
3/8"	1.25	1.25	1.25	1.25
1/2"	1.25	1.25	1.25	1.25
5/8"	1.25	1.25	1.25	1.25
3/4"	1.25	1.25	1.25	1.25

NOTE: For additional charge of various tubing lengths, refer to outdoor unit table.

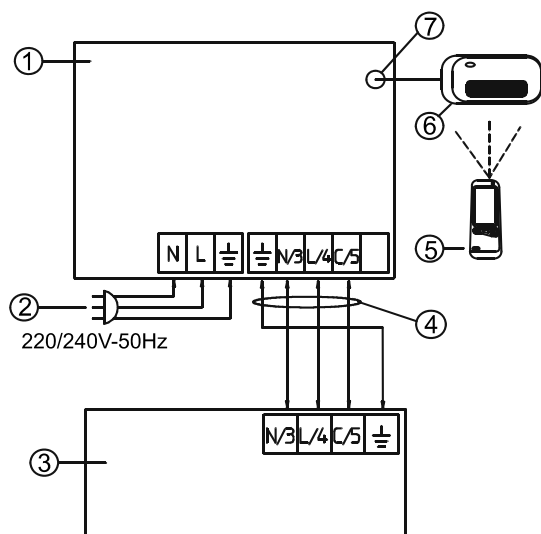
ELECTRICAL CONNECTIONS			ELECTRICAL SPECIFICATIONS			
POWER SUPPLY			1PH UNITS			
NOMINAL		VOLTAGE LIMITS	POWER SUPPLY TO OUTDOOR UNIT			POWER SUPPLY TO INDOOR UNIT
1PH	230/50/1	198-264V	NOMINAL CAPACITY	CIRCUIT BRAKER	POWER SUPPLY CABLE	CIRCUIT BRAKER
			2.5-3.5kW	NOT APPLICABLE		16A
			5.0-6.0kW	20A	3x2.5mm <sup>2</sup>	20A
			7.2kW	20A	3x2.5mm <sup>2</sup>	NOT APPLICABLE

Electrical wiring and connections should be made by qualified electricians in accordance with local electrical codes and regulation. The air conditioner units must be grounded. The air conditioner units must be connected to an adequate power outlet from a separate branch circuit protected by a time delay circuit breaker, as specified on unit's nameplate. Voltage should not vary beyond  $\pm 10\%$  of the rated voltage.

1. Prepare the multiple wire cable ends for connection.
2. Take away the Indoor/outdoor cover and open the terminals, take away the cable clamp screw and turn over the cable clamp.
3. Connect the cable ends to the terminals of the indoor and outdoor units.
4. Connect the other end of the twin wire cable to the outdoor unit twin wire terminal.
5. Secure the multiple wire power cable with the cable clamps.

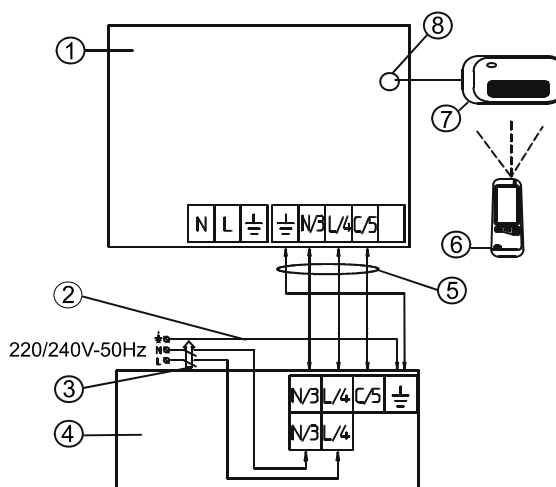


**1PH Units Power supply to indoor  
(2.5, 3.5, 5.0, 6.0 kW units)**



1. Indoor unit
2. Power supply cable
3. Outdoor unit
4. Interconnecting cable  
(2.5÷3.5 kW : 4x1.5 mm<sup>2</sup>)  
(5.0÷6 kW: 4x2.5 mm<sup>2</sup>)
5. Wireless remote control
6. Display unit
7. Display connector

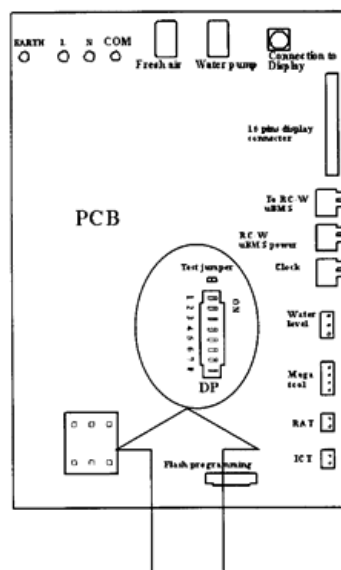
**1PH Units Power supply to outdoor  
(5.0, 6.0, 7.2 kW units)**



1. Indoor unit
  2. Power supply cable
  3. Power breaker (\*by installer)
  4. Outdoor unit
  5. Interconnecting cable (4x2.5mm<sup>2</sup>)
  6. Wireless remote control
  7. Display unit
  8. Display connector
- \* The power breaker must be of type that disconnects all points with 3mm contact opening

## DIPSWITCH SETTING

Each model has his dipswitch setting. It is very important verifying the setting according to the table below during installation for avoiding malfunctioning of the unit.



Dipswitch setting								
	1	2	3	4	5	6	7	8
2.5kW	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
3.5kW	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
5.0kW	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
6.0kW	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
7.2kW	ON	ON	OFF	ON	OFF	OFF	ON	OFF

### Water pump and float switch setting

In case of vertical installation, change dipswitch 7 to OFF position to cancel their operation.

### **High external static pressure**

There is an option of increasing the airflow if the ESP (external static pressure) is higher than planned. To increase the speed change dipswitch 8 to ON position.

## DISPLAY CONTROL UNIT

### LOCATION CRITERIA

It is recommended to install the Display Control Unit close to a ceiling in a central and neutral zone at typical conditions. In addition, the aesthetic aspect should be considered. The Display Control Unit is connected to the main control board on the air conditioner (the indoor unit) by a communication cable. The cable is connected to the Display Control Unit by a quick-connector. (8 pin plug)

### INSTALLATION OF DISPLAY CONTROL UNIT ON WALL

Drill a 12 mm diameter hole on the wall, for routing the communication cable. Open the unit cover, drill 3 holes in the wall to match the holes in the Display Control Unit, install the inserts and fasten the unit to the wall with 3 screws. The Display Control Unit is provided of a special communication cable, 7 meters long, terminated by a plug, connected in the housing itself to a distribution box, which enables the control of the air conditioner from several different rooms, each one from its own Display Control Unit. Connect the quick connector to the appropriate socket on the main control board in the indoor unit electrical box.

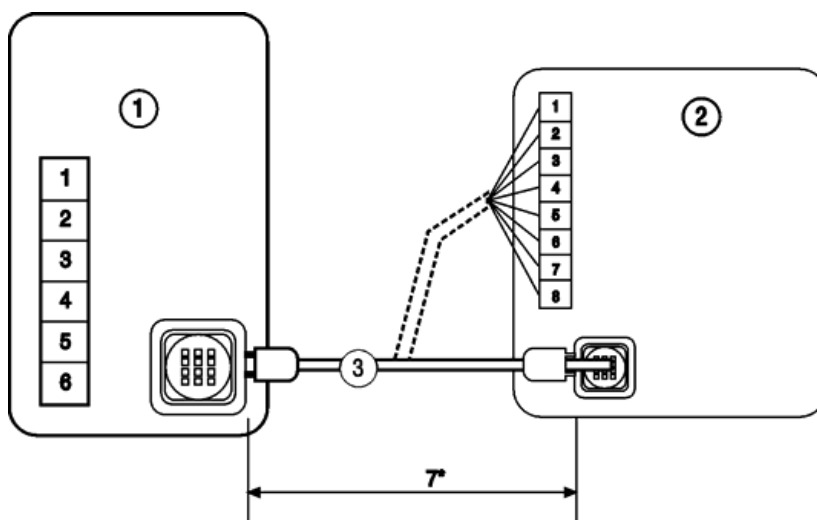


#### WARNING

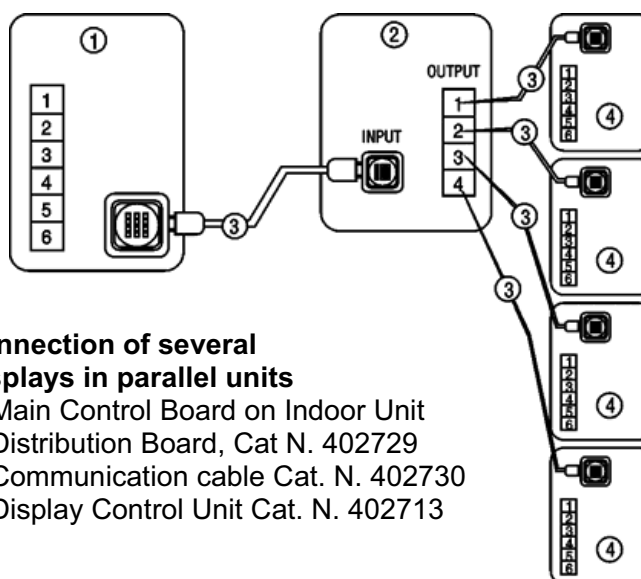
The plug should not be cut off the communication cable if the cable length is insufficient. In such case, a 5-meter extension cable may be added.

### CONSIDERATIONS IN LOCATING THE REMOTE CONTROL UNIT

- Locate the Remote Control Unit in such a way that when mounted on its support on the wall, it will be in line sight with the Display Control Unit (at less than 8 m).
- It is recommended to establish the final location of the Remote Control Unit only after the first operation, assuring proper transmission and reception between the Remote Control Unit and the Display Control Unit.



COLOR CHART	
Conn. Point	Wire Color
1	Gold
2	Green
3	Black
4	Brown
5	Purple
6	Yellow
7	Orange
8	Red



#### Connection of several Displays in parallel units

1. Main Control Board on Indoor Unit
2. Distribution Board, Cat N. 402729
3. Communication cable Cat. N. 402730
4. Display Control Unit Cat. N. 402713

## Check list before operation

### CHECK THE DRAINAGE

Pour water into the drain tray-styrofoam. Ensure that water flows out from drain hose of the indoor unit.

### EVALUATION OF THE PERFORMANCE

Operate the unit at cooling mode and high fan speed for fifteen minutes or more. Measure the temperature of the intake and discharge air. Ensure the difference between the intake temperature and the discharge is more than 8 °C

### CHECK ITEMS

- |  |   |
|--|---|
| <input type="checkbox"/> Is there any gas leakage at flare nut connections?                | <input type="checkbox"/> Is the indoor unit properly mounted to the ceiling?    |
| <input type="checkbox"/> Has the heat insulation been carried out at flare nut connection? | <input type="checkbox"/> Is the power supply voltage complied with rated value? |
| <input type="checkbox"/> Is the connecting cable being fixed to terminal board firmly?     | <input type="checkbox"/> Is there any abnormal sound?                           |
| <input type="checkbox"/> Is the connecting cable being clamped firmly?                     | <input type="checkbox"/> Is the cooling operation normal?                       |
| <input type="checkbox"/> Is the drainage OK?<br>(Refer to "Check the drainage" section)    | <input type="checkbox"/> Is the thermostat operation normal?                    |
| <input type="checkbox"/> Is the earth wire connection properly done?                       | <input type="checkbox"/> Is the remote control's LCD operation normal?          |